The coelacanth—a 'missing link' to extreme lifespans in giant fossil fish?

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Biologists have concluded that the extant African coelacanth *Latimeria chalumnae* (figure 1) has a lifespan of about 100 years.[1,2] They counted calcified structures on coelacanth scales under polarized light microscopy and plotted length-versus-age data for 23 *L. chalumnae* specimens to construct an ontogenetic growth curve. The authors estimated age at first sexual maturity to be between 40 and 69 years, with a gestation lasting about five years. They stated:

> "Our results demonstrate for the first time nearly imperceptible annual calcified structures (circuli) on the scales and show that maximal age of the coelacanth was underestimated by a factor of five. Our validation method suggests that circuli are indeed annual, thus supporting that the coelacanth is among the longest-living fish species, its lifespan being probably around 100 years. Like deep-sea sharks with a reduced metabolism, the coelacanth has among the slowest growth for its size. Further reappraisals of age at first sexual maturity (in the range 40 to 69 years old) and gestation duration (of around five years) show that the living coelacanth has one of the slowest life histories of all marine fish and possibly the longest gestation."[1]

Evolutionists thought the coelacanth had become extinct near the end of the Cretaceous until an extant specimen was discovered in 1938.[3,4]

Figure 1. Model of *Latimeria chalumnae* in the Oxford University Museum of Natural History, showing the brilliant blue colouring it has in life.

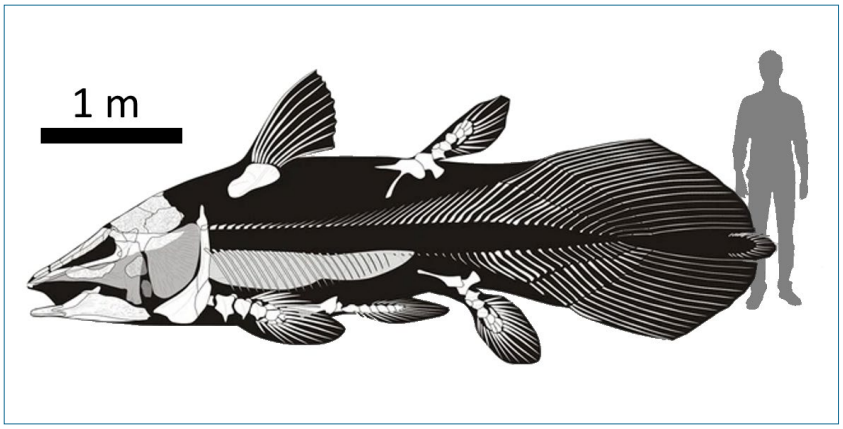

Figure 2. The total estimated length of this giant fossil coelacanth *Mawsonia gigas* is 5.3 m (17.4 ft). Cropped from figure 5 in ref. 8. Greater lifespan is generally positively correlated with greater adult body mass. If extant (and much smaller) coelacanths have lifespans of a century, what age might this giant have attained?

Thus, the coelacanth was dubbed a 'living fossil', although evolutionary scientists now seem to want to 'do away' with that concept.[5,6] Is this because creationists have so effectively pointed out that 'stasis' and 'living fossils' are evidence against evolution?[7] *L. chalumnae* is one of only two species of extant coelacanths; the second, *L. menadoensis*, is found in a few isolated places near Indonesia.

Its stasis over millions of presumed years isn't the only reason creationists might be interested in the coelacanth. The great longevity of *L. chalumnae* may be indirect evidence that giant fossil coelacanths, as well as other giant fossil fish, exhibited even *greater* longevities.

Some fossil coelacanths were much larger than extant ones. One *Mawsonia gigas* specimen, found in Late Jurassic and Mid-Cretaceous rocks (figure 2), has an estimated total length of 5.3 m (17.4 feet).[8] The giant Jurassic *Trachmetopon* is also thought to have been 5 m long.[8] Another mawsoniid coelacanth (species uncertain) is estimated to have been between 3.65 m and 5.52 m long.[9] The Cretaceous giant *Megalocoelacanthus dobiei* is estimated to have had a total length of 3.5–4.5 m.[10–12]

Creation researchers Donald Patten and Greg Beasley suggested that larger adult body sizes and delayed maturation would accompany the extreme longevities demonstrated by pre-Flood organisms, including humans.[13,14] Since then, longevity studies of extant animals have shown that larger adult body masses are positively correlated with longer lifespans.[15] Most of these examples cut across genera, but some are intra-generic and intra-specific.[16] Moreover, biologists have noted that age at maturity is proportional to adult body mass raised to the ¼ power. West *et al.* provided a theoretical justification for why this should be the case, even for organisms with determinate growth.[17] Other biological timescales, such as lifespan and blood circulation time, are also proportional to body mass to the ¼ power.

If the extant coelacanth, with a maximum adult body length of ~1.8 m, has a lifespan of ~100 years, it's not difficult to imagine that giant fossil versions of these creatures might have had lifespans measured in multiple centuries.

Of course, most coelacanth fossils were not this large. Coelacanths found in Paleozoic strata are typically 30–40 cm in length.[18] Indeed, most fossil coelacanths are smaller than the extant ones.[19] It's possible that these smaller body sizes could be adaptations to different environments in the pre-Flood world. In that case, larger body size might not correlate with greater longevity, and this might be an argument against Patten and Beasley's suggestion. But it's also possible that these smaller Paleozoic coelacanth fossils are juveniles or newborns, and that the larger ones are adults. Extant newborn *L. chalumnae* are between 31 and 36 cm in length.[1] Recent calculations by Carter suggest that extremely old members of a population should be relatively rare (specifically in a human population with rapidly decreasing lifespans, but the principle should apply generally to all populations, as seen in the many population pyramid diagrams that can be found for many species).[20] Thus, we should not expect all fossil coelacanths to be full-grown giants, even if Patten and Beasley's hypothesis is correct.

Evolutionists have assigned all fossil coelacanths to different genera than *Latimeria*. However, evolutionists have a tendency to focus on the differences between coelacanths and to 'play down' the similarities. Within a creation framework, these may all

belong to a few Genesis kinds, perhaps even one.

The age of ~100 years for the extant African coelacanth may be the logical link in a chain of reasoning demonstrating that at least some very large fossil fish may have lived much longer than their extant counterparts. This would be partial confirmation of the great human lifespans reported in Genesis, since it is difficult to imagine a non-supernatural mechanism or mechanisms in the pre-Flood world that would increase animal longevity without simultaneously increasing human longevity.

Of greatest possible interest to creationists are Genesis kinds, the fossil representatives of which are much larger than extant ones, as these giant fossil versions may have attained much greater ages than the smaller extant versions. A possible example is the giant 2.6-m-long fossil Pacific salmon (*Oncorhynchus rastrosus*), formerly known as the saber-tooth salmon, which was 42% longer than the largest extant salmonid, the Siberian taimen (*Hucho taimen*).[21,22] Another possible example is a 71-cm-long fossil piranha (*Megapiranha paranensis*); the largest extant piranhas (*Pygocentrus nattereri*) are 50 cm long.[23,24] It's possible the giant fossil versions of these animals were also attaining to much greater ages than their smaller living descendants. And of course, there were other very large fossil fish that have since gone extinct, such as *Leedsichthys problematicus*[25] and *Xiphactinus audax*.[26] Were these giant fish also characterized by extreme ages?

Conclusion

The authors' reported 'longevity' of 100 years is somewhat vague. They apparently don't mean maximum possible lifespan, since their data imply, with considerable uncertainty, that it would take 130 years for *L. chalumnae* to reach 1.90 m, the longest recorded length for an extant *L. chalumnae*. Fortunately, the authors of this paper *have* made their data publicly available. Hence, it may be possible to obtain confidence intervals or prediction bands for their ontogenetic growth curve, making it possible to estimate some of this uncertainty. That, in turn, might enable more rigorous comparisons between pre-Flood and post-Flood lifespans.

References

1. Mahé, K., Ernande, B., and Herbin M., New scale analyses reveal centenarian African coelacanths, *Current Biology* **31**(16):3621–3628, 2021.
2. Yarlagadda, T., Scientists just discovered this 'living fossil' has an incredible lifespan, 20 Feb 2024, inverse.com, accessed 10 June 2024.
3. McGrouther, M., Coelacanth, Latimeria chalumnae Smith, 1939, 28 May 2024, australian.museum, accessed 10 Jun 2024.
4. Smith, J.L.B., A living fish of Mesozoic type, *Nature* **143**(3620):455–456, 1939.
5. Casane, D. and Laurenti, P., Why coelacanths are not 'living fossils', *BioEssays* **35**(4):332–338, 2013.
6. Carnall, M., Let's make living fossils extinct, 6 Jul 2016, theguardian.com, accessed 10 June 2024.
7. Thomas, B., Should we drop the term 'living fossil'? *Creation Science Update*, ICR.org, 18 Jul 2016.
8. Cavin, L., Piuz, A., Ferrante, C., and Guinot, G., Giant Mesozoic coelacanths (Osteichthyes, Actinistia) reveal high body size disparity decoupled from taxic diversity, *Scientific Reports* **11**(1):11812, 2021.
9. Brito, P.M. *et al.*, A marine Late Cretaceous (Maastrichtian) coelacanth from North Africa, *Cretaceous Research* **122**:104768, 2021.
10. Schwimmer, D.R., Stewart, J.D., and Williams, G.D., Giant fossil coelacanths of the Late Cretaceous in the eastern United States, *Geology* **22**(6):503–506, 1994.
11. Dutel, H. *et al.*, The giant Cretaceous Coelacanth (Actinistia, Sarcopterygii) *Megalocoelacanthus dobiei* Schwimmer, Stewart & Williams, 1994, and its bearing on Latimerioidei interrelationships, *PLoS ONE* **8**(6):e49911, 2012.
12. Dutel, H., Pennetier, E., and Pennetier, G., A giant marine coelacanth from the Jurassic of Normandy, France, *J. Vertebrate Paleontology* **34**(5):1239–1242, 2014.
13. Patten, D.W., The longevity accounts in ancient history, CRSQ **19**(1):40–52, 1982.
14. Beasley, G., Pre-flood giantism: a key to the interpretation of fossil hominids and hominoids, *J. Creation* **4**(1):5–55, 1990.
15. Hebert III, L., Allometric and metabolic scaling: arguments for design … and clues to explaining pre-Flood longevity? *Proc. 9th ICC,* pp. 206–227, 2023.
16. Hebert, J., Overman, R., and Sherwin, F.J., *Crassostrea* oyster fossils show evidence of extreme longevity, CRSQ **60**(3):171–190, 2024.
17. West, G.B., Brown, J.H., and Enquist, B.J., A general model for ontogenetic growth, *Nature* **413**(6856):628–631, 2001.
18. Toriño, P., Soto, M., and Perea, D., A comprehensive phylogenetic analysis of coelacanth fishes (Sarcopterygii, Actinistia) with comments on the composition of the Mawsoniidae and Latimeriidae: evaluating old and new methodological challenges and constraints, *Historical Biology* **33**(12):3423–3443, 2021.
19. Editors, Coelacanth, 31 May 2024, britannica.com, accessed 10 Jun 2024.
20. Carter, R., The extreme rarity of long-lived people in the post-Flood era, *J. Creation* **37**(2):63–67, 2023.
21. Claeson, K.M., Sidlauskas, B.L., Troll, R., Prescott, Z.M., and Davis, E.B., From sabers to spikes: a newfangled reconstruction of the ancient, giant, sexually dimorphic Pacific salmon, *Oncorhynchus rastrosus* (Salmoninae: Salmonini), *PLoS ONE* **19**(4):e0300252, 2024.
22. 'Saber' no more: a giant prehistoric salmon had spike teeth, uonews.uoregon.edu, 24 Apr 2024.
23. Grubich, J.R., Huskey, S., Crofts, S., Orti, G., and Porto, J., Mega-bites: Extreme jaw forces of living and extinct piranhas (Serrasalmidae), *Scientific Reports* **2**(1009), 2012.
24. Bailly, N., Froese, R., Pauly, D. *et al.*, Species of Pygocentrus, fishbase.mnhn.fr, accessed 29 May 2024.
25. Shipman, C., The fossilized giant fish *Leedsichthys problematicus* (Woodward, 1889): congruency across natural and biblical history, *Creation Matters* **26**(4):1, 3, 4–6, 2021.
26. Vavrek, MJ., Murray, A. M., and Bell, P.R., *Xiphactinus audax* Leidy 1870 from the Puskwaskau Formation (Santonian to Campanian) of northwestern Alberta, Canada and the distribution of *Xiphactinus* in North America, *Vertebrate Anatomy Morphology Palaeontology* **1**(1):89–100, 2016.