Cave Fish Clocks

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Cave fish clocks described in PLoS Biology and ScienceDaily 6 September 2011. All animals have inbuilt clocks that help maintain their regular cycle of daily activities and body function. These regular cycles are called circadian rhythms. Keeping the clock synchronised with the day/night cycle depends on exposure to light at regular intervals. In order to find out more about how these internal clocks work a group of European scientists have compared the circadian rhythms of the sighted zebra fish with a species of blind cave fish that live in the dark.

According to Cristiano Bertolucci of University of Ferrara, Italy, "Cavefish give us a unique opportunity to understand how profoundly sunlight has influenced our evolution". The research team studied a fish named *Phreatichthys andruzzii*, a Somalian cavefish believed to have "evolved without sunlight for between 1.4 and 2.6 million years". This fish has no eye function and no scales. The researchers first placed both the sighted and blind fish in regulated 12 hours of light and 12 hours of darkness and then observed the fishes' patterns of activity. The zebra fish had a regular cycle of activity in keeping with the light/dark cycle, but the cavefish's pattern of activity was irregular and unrelated to the light/dark cycle it was exposed to.

The researchers then tested the fish to see if they had any time-keeping ability unrelated to light by feeding them at the same time each day. Both kinds of fish showed "food anticipatory behaviour" at the appropriate time. The researchers then studied genes for clock activity and photoreceptors (light receptors) in both fish to see how cave fish differed from normal sighted fish. They found the cave fish clock genes were normal, but the photoreceptor genes had truncation mutations – defects that cause the protein making machinery to stop before completing the light detecting proteins it was supposed to be making. The fact that the cave fish had functioning clock genes but could not make light detecting proteins would explain why they were unresponsive to light/dark cycles, but could respond to a regular time of feeding. To confirm that these mutant genes were the cause of the non-response to light in the cave fish, the research team introduced photoreceptor genes from the zebra fish into cave fish. The genetically modified cave fish responded to the light/dark cycle as normal sighted fish do. Nicholas Foulkes, one of the researchers, claimed the cave fish study provided "a fascinating new insight into how evolution in constant darkness affects animal physiology".

PLoS Biology, Science Daily

Editorial Comment: Finding broken photoreceptor genes does not explain how or where the genetic information for making photoreceptor proteins originated. Furthermore, the only way cave fish gained the ability to detect light/dark cycles during this research was for pre-existent

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intelligent, creative scientists to insert the missing information into the cave fish. This is good evidence that it takes creative design to make a fully functioning fish. On the positive side, the studies do show that some fish in dark regions can survive with defunct light detecting genes, so these studies actually provide no insights into evolution at all, unless you want to cheat on the definition and all you mean by evolution is change of any sort.

Altogether, these studies provide good evidence of non-evolutionary change, which serves as a constant reminder that the real history of the world is from creation to degeneration, or in simple terms: from good to bad to worse. And such change is consistent with the Biblical history of "In the beginning God created" a good world filled with fully functioning creatures, but since the Fall of Man and God's judgement on the earth, many creatures have suffered degenerate change (or damage) to their genes including photoreceptor genes and have survived in a partially defunct state. (Ref. bio-rhythms, ichthyology, genetics)

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