

Scientists study why the blind salamander lives so long

July 22 2010, by Lin Edwards



Proteus anguinus. Image credit: CNRS

(PhysOrg.com) -- Scientists have long been intrigued by the longevity of a tiny amphibian known as the blind salamander, but it now seems it may live a long time because it basically has no life.

The blind salamander (*Proteus anguinus*), also known as the olm, has the longest lifespan of any [amphibian](#), often living to over 70 in zoos, and with a predicted maximum age of over 100. It reaches [sexual maturity](#) during its fifteenth year and lays about 35 eggs every 12.5 years.

The amphibian spends its entire life in water in the dark limestone caves

in southern Europe. Its eyes are atrophied and it has almost no skin pigments. The skin looks pink because the blood shows through, leading to the olm sometimes being called the “human fish”.

The olm is a snake-like creature 25-30 cm long and weighing only up to 20 grams. Most tiny creatures have short lifespans, which is thought to be due to having higher metabolisms that in essence burn the creatures out more quickly, but the olm has a similar metabolic rate to its closest relatives, which have much shorter lifespans. There is also no unusual antioxidant activity in the olm that might explain its longevity.

Scientists at a cave station set up at Moulis, Saint-Girons in France have been studying the olm, an endangered species, since 1952. The cave is a faithful reproduction of the olm’s [natural habitat](#) and has over 400 [salamanders](#) in residence. It is the only successful breeding program of the amphibian, and the project is operated by the National Center for Scientific Research in France. Data on deaths and breeding activity have been recorded at the cave station since 1958.

Ecophysiologicalist Yann Voituron and colleagues, from the Université Claude Bernard Lyon, have been studying the salamanders to try to understand why they live so long in comparison to their relatives. Voituron said they would like to look at the “usual genes associated with increases in lifespan, and maybe hope to detect something new.” They would also like to analyze the creatures on a cellular level and examine their mitochondria, for example, but this would necessitate killing the animals, and they do not want to do this because they have so few to work with.

The scientists estimated the maximum age from the knowledge the oldest inhabitants of the cave are now at least 48 and probably in their mid or late fifties, and in related species the average lifespan is between 10 and 67 percent of the longest lifespan known for the species. This

gives a conservative estimate of a maximum lifespan of 102 years for the olm, or almost double the maximum lifespan of other long-lived amphibians such as the Japanese giant salamander, with a maximum of 55 years.

Voituron said the studies have shown the olm is extremely inactive and rarely moves except to feed and to reproduce (which only happens every 12.5 years). There are no predators in the caves, so they live a stress-free life.

The researchers think the salamander's limited activity and an adjusted physiology may be a way to reduce production of reactive oxygen species (that damage cells as they age) without increased antioxidants or a lower basal [metabolic rate](#). The paper, published online in the journal *Royal Society Biology Letters* concludes the olm raises questions about aging and "appears as a promising model" to study mechanisms preventing aging processes in vertebrates.

More information: Extreme lifespan of the human fish (Proteus anguinus): a challenge for ageing mechanisms, *Biology Letters*, Published online before print July 21, 2010, [doi:10.1098/rsbl.2010.0539](https://doi.org/10.1098/rsbl.2010.0539)

© 2010 PhysOrg.com

Citation: Scientists study why the blind salamander lives so long (2010, July 22) retrieved 10 April 2024 from <https://phys.org/news/2010-07-scientists-salamander.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.
