



NOTA DE PRENSA

Radiation levels currently experienced by Chornobyl tree frogs has no effects on their age or ageing

The study, led by Germán Orizaola, professor of Zoology at the University of Oviedo, and researcher Pablo Burraco, from the Doñana-CSIC Biological Station, has just been published in the journal 'Biology Letters' of the British Royal Society.

International researchers have collaborated in this work to accurately analyse the long-term effects of the nuclear power plant accident on wildlife.



The study focused on the Eastern tree frog (Hyla orientalis). Credit: Germán Orizaola

Seville, 6th November 2024. Radiation levels experienced by frogs living in Chernobyl have not affected their age or ageing. In fact, these two traits do not differ between frogs caught in areas with high radiation levels and those living in control areas without radiation. No differences were also found in the levels of corticosterone, a hormone associated with the stress response, regarding the radiation received by these amphibians. These are the main findings of a research led by the University of Oviedo and the Doñana Biological Station, with the collaboration of international experts, where they have analysed the possible longlasting effects of radiation on the age and ageing of Chernobyl wildlife for the first time. This work has recently been published in the journal [Biology Letters](#) of the British Royal Society, of maximum impact in this study area.

Germán Orizaola, professor of Zoology at the University of Oviedo, highlights that these results indicate that "the levels of radiation currently experienced by frogs in Chernobyl *would not be sufficient to cause chronic damage* to these organisms." The development of this type of study that accurately measures radiation exposure and analyzes long-term biological traits, such as age and rate of aging, "is essential to carry out a correct assessment of the current impact of the accident on wildlife. The results of this work reinforce the role of the Chernobyl Exclusion Zone as a wildlife refuge that must be preserved," adds this researcher.

The authors of the paper recall that almost four decades have passed since the accident at reactor 4 of the Chernobyl nuclear power plant (Ukraine). During this time, radiation levels have dropped considerably in the areas initially affected. It is estimated that less than 10% of the radiation emitted in the accident remains, and some of the most dangerous isotopes, such as iodine, disappeared within a few months of the accident. Recent studies show, in fact, that Chernobyl has become one of the largest natural reserves in Europe. This explains why it is essential to carry out a precise assessment of the extent to which this accident continues to have harmful effects on the environment today.

A work that began in 2016

The team led by Germán Orizaola has been working in Chernobyl since 2016, examining the state of animal populations in the area. Their studies have focused on amphibians, specifically the eastern frog (*Hyla orientalis*). Previous research detected an absence of effects of current radiation exposure on different physiological and morphological parameters associated with the health status of this species. In this work, the scientists have examined the effects of radiation on the age and rate of aging of these amphibians. This is a key aspect to assessing the long-term effects of radiation exposure, as it can reflect the accumulation of damage throughout the life of the animal.

The field work, carried out in collaboration with Pablo Burraco, a researcher at the Doñana Biological Station, was conducted in three successive campaigns in Ukraine between 2016 and 2018. In this study, the researchers have sampled populations of this amphibian along the entire gradient of radioactive contamination present in the area, including from some of the most contaminated areas on the planet to areas without radioactive contamination. In total, they captured more than 200 male eastern St. Anthony's frogs in 14 different locations, which they took to their field laboratory in the city of Chernobyl (Ukraine).

"In all the frogs, we calculated the level of radiation absorbed based on the environmental radiation and the cesium content in their muscles and strontium in their bones. This has been one of the most precise assessments of absorbed radiation carried out on a vertebrate in Chernobyl," says Pablo Burraco.

The researchers point out that in amphibians, it is possible to calculate the age of an individual by counting the growth lines of their bones that form each year, in the same way that the age of a tree is obtained. This work has also examined the rate of aging of these individuals using the length of the telomeres as a marker.



Telomeres are DNA sequences located at the end of chromosomes, which protect the genetic material and shorten with each cell division. In addition, the levels of the hormone corticosterone in the blood of the individuals have been measured as a marker associated with response to stress.

Referencia

Pablo Burraco, Caitlin Gabor, Amanda Bryant, Vanessa Gardette, Thierry Lengagne, Jean-Marc Bonzom, Germán Orizaola 2024. Ionizing frogs radiation has negligible effects on the age, telomere length, and corticosterone levels of Chernóbil tree. *Biology Letters* 20, 20240287. DOI: <https://doi.org/10.1098/rsbl.2024.0287>



Researchers Germán Orizaola and Pablo Burraco with Ukrainian scientist Sergii Gashchak during their fieldwork in the Chernobyl Exclusion Zone (Ukraine) // Credit: Germán Orizaola