

Presence of snails points to forest recovery

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This is a live specimen of a terrestrial gastropod common in the Iberian Peninsula, *Cernuella virgata*, one of the most favored species after a fire. Credit: Vincenç Bros.

A team of Catalan researchers has studied the changes in the make-up of animal populations following forest fires, and have concluded that malacological fauna are a good indicator of forest recovery. The conclusions of this study will help to ensure that post-fire forestry operations that do not harm these species of molluscs, which are sensitive to microclimatic conditions of the soil and vegetation structure.

The researchers from the University of Barcelona (UB) and the Natural Areas Department of the Provincial Government of Barcelona took samples from areas on the edges of an area affected by a forest fire that took place in August 2003 on the outskirts of the Sant Llorenç del Munt i l'Obac Natural Park in Catalonia.

The objective of this study, which has been recently published in [Biodiversity and Conservation](#), was to check whether land molluscs, which are invertebrates with limited mobility, would re-colonise the burnt areas or manage to survive the fire in refuges.

"Forest fires produce radical changes in the [environmental conditions](#) of the habitat of land gastropods, such as changes to the vegetation structure, and the absence of humus and [leaf litter](#), and so the composition of species within the mollusc community is very severely affected", Xavier Santos, lead author of the study and a researcher at the Department of Animal Biology of the UB, tells SINC.

According to the team, "land mollusc fauna is a good indicator of the processes of faunal recovery in areas affected by forest fires" because these are species that are very sensitive to microclimatic conditions of the soil and vegetation structure. The scientists identified 25 species of land gastropods, with large differences seen between the control stations and burnt areas.

"In the burnt zones there is a very significant absence of numerous forest species that are widespread throughout Europe, such as *Pomatias elegans* and *Acanthinula aculeata*, and an increase in species that are more characteristic of more open or drier environments (*Cernuella virgata* and *Xerocrassa penchinati*), due to the simplification of the habitat structure", explains Santos.

The biologists thus demonstrate the negative effects of a forest fire on the area's diversity of mollusc populations. "This group of organisms only re-colonise the edges of areas affected by fire in a very limited way", says the researcher, who also says that those areas closest to the edges of the fire have not seen any significant increase in forest species. In addition, the 2004 to 2007 drought may also have reduced the ability of gastropods to re-colonise the burnt areas.

However, the scientists have detected some land molluscs that are typical of forest environments existing in the burnt zones, which managed to survive in closed refuges such as tree trunks and rocks.

Post-fire management applications

"These results come into their own in helping to decide between different management models for Mediterranean forest environments that have recently been affected by fire - for example replanting the area with conifers", explains the researcher.

Forest fires are common phenomena and cause great destruction to natural areas in Mediterranean environments. The authors of the study say it is "very important to evaluate how organisms respond to these impacts".

The scientists used studies carried out in the south of France and in the United States as their starting point in this research, above all the 2002 [forest fire](#) in the central grasslands of the United States (in the states of Wisconsin, Iowa and Minnesota), which led to 44% of species there experiencing population declines. The situation was dramatic for [snails](#) - these animals underwent the most severe declines due to the fire having destroyed all plant waste.

More information: Santos, Xavier; Bros, Vicenç; Miño, Ángel.
"Recolonization of a burned Mediterranean area by terrestrial gastropods" *Biodiversity and Conservation* 18(12): 3153-3165, Nov 2009.

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