

Three new arthropod species have been found in the Maestrazgo Caves in Teruel

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This is the new species *Pygmarrhopalites maestrazgoensis*. Credit: Rafael Jordana; Enrique Barquero

A team of scientists from the University of Navarra and the Catalan

Association of Biospeleology have discovered three new collembolan species in the Maestrazgo caves in Teruel, Spain. Their description has been published in the *Zootaxa* journal. These minute animals belong to one of the most ancient animal species on the planet.

The Maestrazgo [caves](#) in Teruel are located in a region of the Iberian Range where fauna has not been the subject of much study. It is a very isolated region since its average altitude is between 1,550 m and 2,000 m asl and its climate can be described as "almost extreme" experiencing temperatures of between -40°C and -25°C . Inside the caves, however, the temperatures remain constant at between 5°C and 11°C .

"Studying fauna in the caves allows us to expand on our knowledge of biodiversity. In the case of the three new collembolan species that we have found in Teruel, they are organisms that have survived totally isolated for thousands of years. Having 'relatives' on the surface means they act like relics from the past that have survived the [climate change](#) taken place on the outside of the caves," as explained to SINC by Enrique Baquero, who carried out a taxonomic study along with Rafael Jordana, both of whom are from the University of Navarra.



This is the Espeologos team during the descent into the cave. Credit: Floren Fadrique

For these scientists it is vital to study how new species found adapt to the cave environments. "Like other cave-adapted animals, the collembolans require greater chemical sensitivity as they cannot use their sight in the absence of light", explains Baquero.

These animals are arthropods from the hexapod group (meaning six legs), a parallel group to insects. However, they are different and more primitive, showing absence of wings, different structure of their mouth, presence of the ventral organ and frequently, presence of the springing organ named the furca (an uneven abdomen appendix used to jump far away from danger).

Field work in extreme conditions

The three new species of collembolan documented in the investigation published in the [Zootaxa](#) journal belong to very different groups and are phylogenetically separate from one another. They have been named *Pygmarrhopalites maestrazgoensis*, *P. cantavetulae* and *Oncopodura fadriquei*. The researchers have also found specimens of five other [species](#) in the caves that have already been documented in nearby and further away caves.

These animals were found by a team of speleologists headed by Floren Fadrique from the Catalan Association of Biospeleology. They entered different caves in harsh conditions of cold, humidity and darkness.

The expert concludes that "the animals were captured by laying down traps. These consisted of jars containing different liquids, which the [animals](#) approached in search of food. They were then trapped until the speleologists returned to collect them. Professor Jordana and I received the samples collected by the speleologists and proceeded to their identification."

More information: Rafael Jordana, Floren Fadrique, Enrique Barquero. "The collembolan fauna of Maestrazgo caves (Teruel, Spain) with description of three new species", *Zootaxa* 3502: 49 – 71, 2012.

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