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## *The Office of Communication* *Press Release*

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### **The University of Jaen discovers fossil bacteria and fungi with more than 150 million years in the Betic-Rif mountain range**

Investigators from the Universities of Jaén, Granada and Tetuan, supervised by **Matias Reolid Perez**, have discovered outcrops of fossil bacteria and fungi with more than 160 years on the Betic-Rif mountain range. This investigation was developed with the project UJA Plan Propio.

The study was conducted in outcrops with materials from the Middle Jurassic age, containing iron and manganese crusts in the Betic-Rif mountain range, particularly in the provinces of Cordoba, Murcia, Alicante and the North of Morocco.

The investigations developed in this project have allowed to distinguish two types of crust fossil bacteria and fungi present, a source hydrogenetic, formed directly on the sea bottom and even in the underwater caves, and the most spectacular ones of hydrothermal origin found in Morocco. In all of the findings, geochemical, mineralogical, petrographic microscope and SEM tests were conducted.

“We found materials from manganese crusts of the Middle Jurassic age, that is from more than 160 million years ago, whose geochemistry and mineralogy have allowed us to interpret its origin as hydrothermal, which is also the first time this is recorded as with a Jurassic origin throughout the Mediterranean. The study with the SEM has revealed fossil fungi and bacteria with exceptional preservation of manganese oxide,” says the researcher.

The importance of this discovery is that it that it settles that there are prior examples of bacteria present in the deep ocean in relation to the hydrothermal vents (black smokes) with the same behavior as the ones found in this study.

“The most important thing is that there are many proposals which indicate that life could have arisen in this type of underwater environments 3500 million years ago,” says Reolid.



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The scientists interpret this formation as with an origin within the hydrothermal springs with water of over 200°C enriched with metallic materials, mainly manganese. These waters reached the seabed rising in favor of faults that fractured the sea floor.

Just like in the case of the hydrothermal crusts found in the North of Africa, the hydrogenetic crusts studied in the southeast of Spain, particularly in the External Betic, a deep underwater environment was identified as the perfect place for their formation. The lack of light prevented the growth of photosynthetic microorganisms thus researchers concluded that these organisms performed chemical reaction in order to obtain energy, that is they were chemosynthetic organisms.

In the future the researchers are seeking to find more outcrops and make a connection between hydrogenetic crops of the Betic mountain range and the hydrothermal crops from the Rift mountain range as they are from the same age and are related to the events in the marine sedimentation of both margins of the so-called Sea of Tethys. The search will continue looking at outcrops of the Rif Mountains (Morocco) and the Sierra de Cabra (Cordoba), with the peculiarity that the latter has ancient underwater caves where this type of bacteria grows.

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