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Ecosensor researchers have taken air samples in the places where it is easiest to detect the rain of microorganisms, such as high-mountain lakes. "Such spots have barely been altered by local human activity" Reche remarks, " so they are invaluable for studying the incidence of invading airborne microorganisms blown in from remote sources".

The lakes chosen are located in Sierra Nevada and the Pyrenees, as well as the Alps (Austria), Argentinean Patagonia, the Bylot Islands in the Arctic (Canada), and the South Shetland archipelago (Antarctica).

The researchers suck out air, filter it and extract the DNA of the organisms present. "By analyzing the genes we can tell what microorganism they belong to," Reche continues. They also separate the microorganisms to ascertain which can reach the lakes alive.

The same life in Sierra Nevada, the Pyrenees and Mauritania

Their results, which have recently appeared in various scientific publications, show that Sierra Nevada and Pyrenean lakes harbor microorganisms "that we have also found in the soil in Mauritania", says Reche. "It is truly amazing". Among the microorganisms identified are Pseudomonas - a Bacillus genus capable of colonizing a wide range of niches; Staphylococci - a genus that includes microorganisms present in human skin, and Acinetobacter, which contribute to the mineralization of the soil. In general terms, they are considered to be non-pathogenic for humans.

But how might the advent of these new microorganisms affect local ecosystems? "The increase in dust load in pristine ecosystems, like high-mountain lakes, has major repercussions" explains Reche, "because with it come nutrients that fertilize the lakes and alter their microbial communities" Some of these changes have harmful effects; indeed the dust may already be damaging the fauna and flora of some ecosystems. Caribbean corals, for instance, are suffering decline due to excess dust deposition.

Another big question is, how do microorganisms manage to stay biologically active after their journey? The dust travels at between 2000 and 4000 meters altitude, exposed to severe dryness and harmful radiation; not all the organisms found form spores, so they must have other defense mechanisms at their command. One hypothesis mentioned by Reche is "an increase in the quantity of protective pigments, which adhere to the mineral particles, conferring a degree of protection".

Source: Silvia Churruca Fundación BBVA

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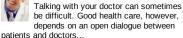
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