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loss in Europe and impacts for society.**

The effect of climatic variation on the mountain bumblebee fauna

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We surveyed the bumblebees fauna in a small area in Pyrenees-Orientales (SW. France) during 10 years. During this time, we observed very important variations of the species relative abundance. Some species that were once very abundant, as *Bombus lucorum* and *B. sylvarum*, could have been nearly absent of our samples other years. We also observed evident signs of local droughts and heatwaves. We hypothesised that the faunistic variations could have been related to these extreme climatic events. To test this hypothesis in first approximation, we established the correlations between the relative abundance of each species and several local climatic parameters. In the 13 bumblebee species tested, we observed that the relative abundance of 9 and the whole population density show a significant correlation with at least one climatic parameter. The cold and wet years have the highest diversity and population density, while the dry and hot years are correlated with the lowest density and diversity. Most species, as *B. lucorum* and *B. pyrenaicus*, seem particularly sensitive to drought while a few others, as *B. sylvarum* and *B. mesomelas*, seem to take advantage of these conditions.

Are droughts and heatwaves leading to local extinctions of bumblebees?

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It is now well known that a lot of bumblebees species are threatened in Europe and in N. America. Various hypotheses have been proposed to explain the regressions. Some of the hypothetical factors act at a continental level, as the general restructuration of the agriculture toward the use of synthetic nitrogen fertilisation, in place of leguminous. The landscape fragmentation is typically a local factor of the spatial coalescence of which leads to large-scale effects. Since 2002, we observed a great number of situations where local droughts and heatwaves occurred in France, UK, Scandinavia, Turkey, leading to very strong local reductions of the bumblebees fauna. We observed so many local cases in 2007-2009 that we could hypothesise that a coalescence of these local effects could lead to a new general threat. Some species seem to be very sensitive to these risks: *B. lucorum* and *B. magnus* are noticeable cases.