Vulnerability of subalpine habitats to climate change: the case of Diptera syrphidae in the Hauts de Chartreuses National Nature Reserve (Isère, 38) between 2008 and 2020

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Abstract

As part of the management plan for the Hauts de Chartreuse National Nature Reserve, a second study on syrphid diptera is being carried out in 2019 and 2020 on two sectors, first studied in 2008. The aim was to measure the evolution of the ecological status of these high-altitude habitats (mainly subalpine grasslands and pine forests) since 2008.
A decrease in hoverflies has been observed (-16% of total abundance; -7% of species richness) between 2008 and 2020. The data were processed using the Syrph the Net expert system, which made it possible to compare, for each habitat, the observed hoverfly stand compared to an expected stand. Particular attention was paid to the evolution of the processions since 2008.

The lawns and subalpine moors of Mont Granier seem to be of limited ecological integrity and have recorded a decrease in ecological integrity of -21% since 2008, a probable consequence of a loss of floristic typicity. At the Dent de Crolles this type of habitat has changed very little during the decade and maintains good ecological integrity.

In spite of good results in 2019-2020, the Pine forests also show a decrease in functionality, down to -32% at Mont Granier. The diagnosis points above all to a dysfunction in forest recruitment (Pines and accompanying species).
Climate change could be at the origin of this degradation. The increase in the proportions of unexpected species with mountain or even hillside ecological affinities supports this hypothesis. Several monitoring studies (meteorology, botany) are proposed to better understand the disturbances raised during this study.

Keywords: Hoverflies, bioindicator, ecological integrity, Unimproved subalpine grassland, Pinus Forest

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