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Bât. K | Campus CIRAD-Baillarguet | Montpellier



Evolutionary changes in sessile oak in response to climate change since the “Little Ice Age” in three French forests.

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Abstract: Present-day climate change represents a challenge for natural species as they have to adapt to new environmental conditions in a few generations. The mid-XIXth century represented the transition from the Little Ice Age to the Anthropocene. Long life-span organisms such as sessile oaks (*Quercus petraea*) are contemporary witnesses of this change. In three French forests, we identified four plots corresponding to four cohorts of distinct ages: 340, 160, 50 and 10 years old. In each of the twelve cohorts, DNA was extracted from about 50 trees and pooled for whole genome sequencing. We inferred the demographic history of forests and cohorts using phylogenetic analyses. We combined several genome scan statistics to detect signatures of selection between the different cohorts. We believe this allochronic approach is suited for the study of rapid adaptation to various factors.

Recent publications:

Sáenz-Romero, C., Lamy, J.-B., Ducousso, A., Musch, B., Ehrenmann, F., Delzon, S., ... Kremer, A. (2017). Adaptive and plastic responses of *Quercus petraea* populations to climate across Europe. *Global Change Biology*, 23, 2831–2847. <https://doi.org/10.1111/gcb.13576>

Kremer, A. (2016). Microevolution of European temperate oaks in response to environmental changes. *Comptes Rendus Biologies*, 339(7–8), 263–267. <https://doi.org/10.1016/j.crv.2016.04.014>

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