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## Geographic distribution and evolution of *Cucurbitaceae* and *Solanaceae* viruses in the French Mediterranean basin

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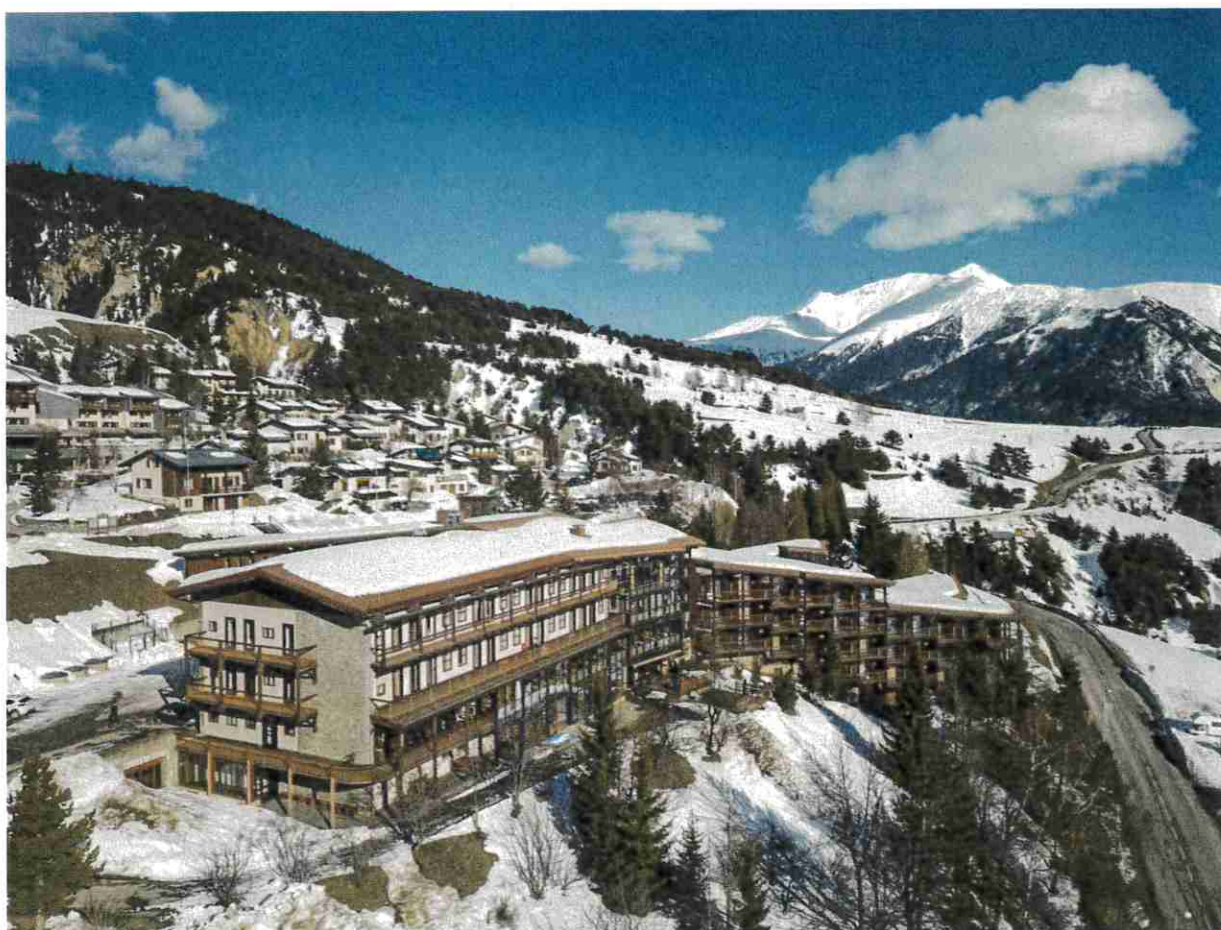
Emerging plant viral diseases represent a significant burden to plant health, and their highest impact in Mediterranean agriculture is on vegetables grown under intensive horticultural practices. The emergence of a new viral disease results from a complex interaction among several factors, including ecological changes of host and vector populations, and genetic changes due to the introduction of new crop varieties and the evolution of the viruses and/or vectors. As part of a larger research project devoted to Emergent viruses and virus vectors in Mediterranean Basin crops (EMERAMB, ARIMnet2 action) we assessed i) the mapping of viruses and aphids in *Cucurbitaceae/Solanaceae* crops and reservoirs on the entire French Mediterranean area, and ii) the impact of virus diversity and evolution on the emergence of plant viral diseases, including aspects such as virus adaptation to new hosts/environments, virulence evolution, biogeography and molecular epidemiology. Two surveys were performed in summer 2016 and 2017, representing a total of 1619 crop samples, 351 weed reservoirs and 1121 aphids. The plant samples were analyzed using serological and molecular diagnostic tools, including next generation sequencing (NGS). The viral species and their frequency in crops were quite similar to those of surveys conducted ten years ago in the same areas. Contrary to other Mediterranean countries, aphid-transmitted viruses remain the most prevalent problems in France whereas whitefly-transmitted ones have not yet emerged. However, NGS analysis of viral evolution reveals the appearance of viral variants undescribed until now especially for watermelon mosaic virus (WMV), or viral variants not present in France until now as for cucumber mosaic virus (CMV). Analysis of the deep sequencing results revealed also different geographic structures depending of the viral species and their mode of transmission.

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