

Supplementary file 1:

Cultivar Genomic offset of Western Olive varieties

We applied the Cultivar Genomic Offset framework to key olive cultivars cultivated in the Western Mediterranean, including Picholine from southern France, Lechín de Sevilla, Picual, and Manzanilla from Spain, and Picholine Marocaine from Morocco. We found distinct spatial patterns of adaptation among the five varieties. In particular, Picholine showed strong adaptation in southern France and northern Spain, highlighting a clear trend toward higher latitude adaptation. Among the Spanish cultivars, Picual and Manzanilla exhibited broader spatial adaptation, while Lechín de Sevilla showed a more localized pattern of adaptation in southern Spain and Mediterranean North Africa. Contrary to expectations, the Moroccan cultivar Picholine Marocaine displayed high estimated adaptation in northern Spain and southern France, whereas in Morocco we detected low genomic offset only in the northern Mediterranean coastal regions. These findings reinforce the importance of characterizing local Moroccan varieties or seed-borne material that could enhance cultivar adaptation to southern Mediterranean climates and improve resilience under future temperature scenarios.

