

Publication

The last hornbeam forests in SW Europe: new evidence on the demise of *Carpinus betulus* in NW Iberia

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Author(s) Munoz Sobrino, Castor; Garcia-Moreiras, Iria; Gomez-Orellana, Luis; Jose Iriarte-Chiapusso, Maria; Heiri, Oliver; Lotter, Andre F.; Ramil-Rego, Pablo

Author(s) at UniBasel [Heiri, Oliver](#) ;

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Carpinus betulus L. is a mesic, usually considered late-successional tree widely distributed in Europe, but almost absent from Iberia, where it is generally assumed that disappeared during the coldest stages of the Wurm. High-resolution pollen analyses were carried out in C-14 dated sediments from a drowned estuary (ria) and a small mountain lake. *Carpinus* pollen identification was confirmed by comparative light and scanning electron microscopy. Hornbeam dynamics are interpreted using palaeoclimatic reconstructions based on independent proxies (diatoms, chironomids and dinocysts). Our results support that hornbeam declined between ca. 60,000 and ca. 9,000 cal yr bp, when multiproxy evidence suggests a major regional relative sea-level rise. Moreover, chironomid-inferred July temperatures show an increase of more than 6 A degrees C between 15,600 and 10,500 cal yr bp, while freshwater aquatics and diatoms indicate a general tendency towards increasing precipitation and a more oceanic climate. *Carpinus* survived during the Wurm in a variety of habitats in coastal valleys in NW Iberia which had adequate climatic and edaphic conditions. Such habitats might be comparable to the oak-ash, ravine, and hardwood floodplain forests currently existing in other regions of Europe. Large areas of these coastal ecosystems disappeared at the onset of the Holocene, when the sea-level rose. Later hornbeam was apparently unable to compete and expand further inland. Therefore, the sea-level rise combined with the climatically-induced Holocene tree succession and the increasing human impact during the Mid and Late Holocene led to hornbeam progressively becoming a marginal tree in the area.

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