



## **Reconstruction and semi-quantification of human impact in the Dijle catchment, Belgium: a palynological and statistical approach**

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Reconstructing and quantifying human impact is an important step to understand human-environment interactions in the past. To fully understand how, when and to what extent humans have changed the environment during the Holocene, detailed reconstructions of the vegetation changes and quantitative measures of human impact on the landscape during the Holocene are needed.

In this study we present a reconstruction of vegetation changes throughout the Holocene based on palynological data of six study sites in the Dijle catchment, located in the Belgian loess belt. A reconstruction of human impact in the catchment is extracted from the palynological study based on multivariate statistical analyses (cluster analysis and non-metric multidimensional scaling (NMDS)). The NMDS analysis on the pollen data do not detect large-scale Mesolithic or Neolithic human activities on the Dijle catchment. In these periods, human impact in the catchment was probably limited to local disturbances and small-scale forest clearances. Only from the Bronze Age onwards (ca. 3900 cal a BP) human impact was clearly detected in the pollen records and vegetation gradually changed. Human impact further increased from the Iron Age onwards, except for a temporary halt between ca. 1900 and 1600 cal a BP, possibly coupled with the Migration Period in Europe. The general vegetation development and increasing human impact are rather similar at the catchment scale, beside some local variations in timing and intensity of the human impact in the different subcatchments. The applied methodology, cluster analysis and NMDS, proves to be a useful tool to provide semi-quantitative insights in the temporal and spatial vegetation changes related to increasing human impact. The technique can be used to compare and integrate datasets from different study sites within one catchment.