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# Biodiversity dynamics, land use and Holocene landscape of Northwest France

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## Abstract

Palaeo-ecology makes an important contribution to the understanding of biodiversity dynamics. Various studies using pollen stratigraphies have demonstrated significant correlations between Holocene plant diversity, climate and human activities.

This study aims to reconstruct and explain spatio-temporal trends in past plant diversity (alpha, temporal, spatial beta diversity) of Northwestern France during the Holocene period. This area is rich in high-resolution palaeo-botanical data. About fifty well-dated and high-quality pollen records from four different regions in the Armorican peninsula (Western Brittany, Morbihan Gulf region, Loire region, Eastern Brittany) were taken into account. All sampling contexts consist of peat bogs. Therefore it is possible to reconstruct the vegetation changes of the main long-term trends in great detail.

Studies in past plant biodiversity research have significantly increased after the introduction of the rarefaction technique. With the "expected number" of taxa independent of the number of counted pollen grains, the comparison between levels of a set of samples is meaningful. For the first time, rarefaction analysis was performed on a such great number of western French Holocene pollen sequences. Additionally an analysis was made on the development of a selection of vegetation groups represented in Armorican pollen records during the period under study

During the Holocene time span, the plant diversity and more generally the landscape underwent a set of major changes linked to far-reaching socio-economic transformations. The taxonomic richness increases steadily. Some spatio-temporal differences are observed. The increasing richness values correspond with the growing impact of human activities. At the same pace the number of vegetation groups at a regional scale provides insights on the level of landscape heterogeneity and the character of the landscape mosaic. The highest diversity is reached in the later Middle Ages. Most pollen records demonstrate a decrease in floristic richness since the 18th/19th century AD, due to agricultural intensification.

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