Exploring human impacts on biodiversity using palaeoecological data

BIO250
Palaeoecology

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Abstract

Paleo-ecological pollen records have the potential to hold massive amounts of information regarding past environments. By investigating pollen samples extracted from the coastal heathland at Lygra, and counting present species logged at different depths in the sediments, it was possible to construct a pollen-diagram from the results using R-studio. Further investigating the data and the pollen-diagram, allowed conclusions to be made about how humans have affected the surrounding biodiversity. From the results, we found that the impact made from humans seemed to have increased the species richness in the area.

Aim:
Investigate how human influence have made an impact on the biodiversity at Lygra

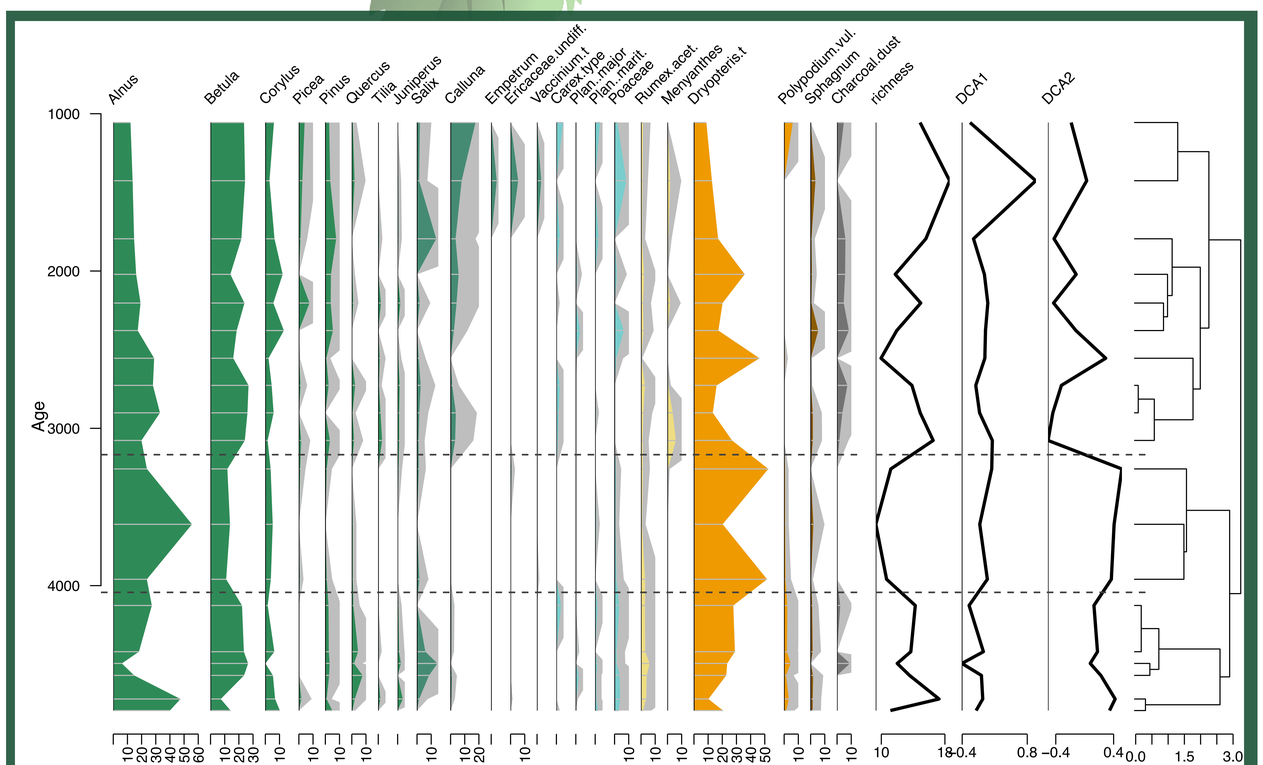

Figure 1: Pollen diagram with pollen measures of 22 different species, presence of charcoal, and a richness curve along the x-axis, and age (BD) along the y-axis

Method

Samples from a peat-core extracted from a bog in Lygra was separated and sorted by depth at 10cm intervals and washed. Matter containing pollen and other proxies were preserved in microscope-slides using wax. The slides were examined using a microscope, and the observed pollen-species were counted and logged in a counting-sheet as they were identified. After transferring the counting sheets into Excel, using R-studio a pollen-diagram was constructed.

Results

Trends derived from the pollen diagram shows a positive correlation between species richness and charcoal absence between 4000-3100 BC. Counted grass, herb and shrub pollen at its lowest for this time period, whereas *Alnus glutinosa* peaks. The fern, *Dryopteris thelypteris*, has also a high pollen abundance between this time period. Detection of *Calluna vulgaris* pollen increases after 3100 BC at the same time as charcoal-remains is present in the sample. Approaching 1000 BC charcoal presence remains fairly constant, tree species are stable or decrease, as grass, herb and shrub species increase.

Discussion & Conclusion

The findings of charcoal suggest human presence in the area as early as before 4000 BC. Therefore, the decrease of both *Betula* (from around 4200 BC) and *Alnus* (from around 3600 BC) might have been caused by human deforestation. Decrease in tree density can have given other species an opportunity to establish, whereas a higher density of trees creates more shadow for species below the canopy.

Palaeoecological evidence has proposed that agricultural practices started as early as around 3400-2600 BC some places in western Norway. This period is also when the presence of charcoal starts to be constant, the amount of tree pollen stabilizes, and pollen from grasses, shrubs and herbs starts increasing.

Therefore, this study suggests that **human disturbance has made a positive impact on the species richness in the area.**

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