Tree species diversity in Lygra

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BACKGROUND

Trees play an important role in shaping ecosystems, with their distribution and abundance influenced by climatic factors such as temperature and precipitation, as well as human activities including grazing, burning and deforestation. In western Norway, these factors have contributed to long-term vegetation changes and the maintenance of open heathland landscapes. Peat bog sediments preserve pollen and plant macrofossils, providing valuable records of past vegetation and environmental conditions. By combining pollen and macrofossil analysis, past changes in local tree species composition can be reconstructed.

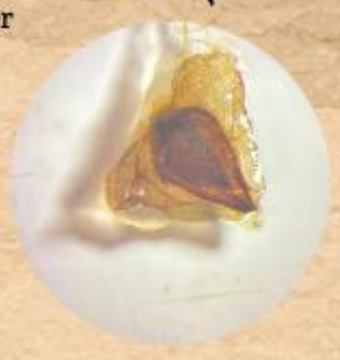
Research question:
How has tree composition and diversity changed throughout geological time in Lygra?



Step 1: Core with russian corer in a bog at Lygra



Step 2: Identifying tree macrofossils with magnifier





Step 3: Identify tree pollen in additional pollen samples from same site with microscope

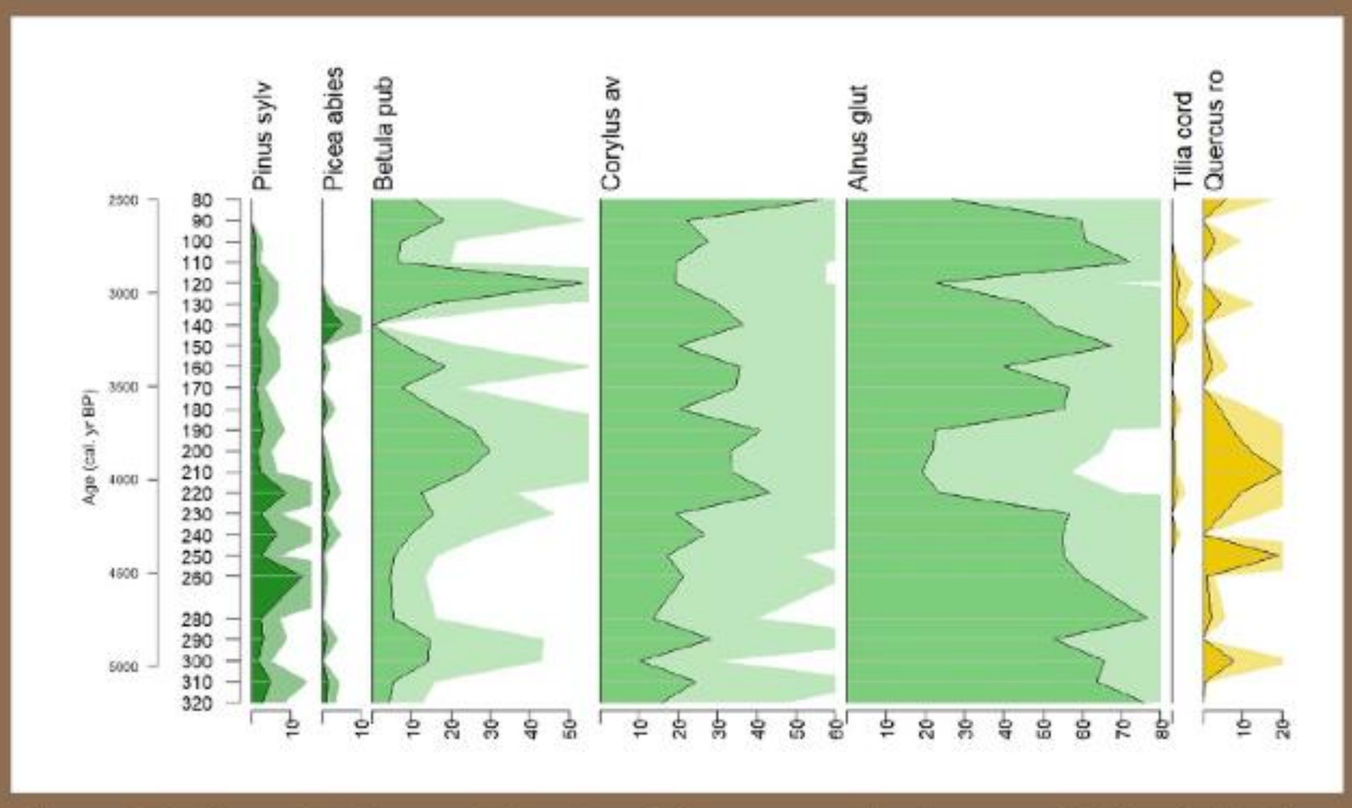


Figure 1: Pollen diagram based on samples from Lygra. Pollen percentages for pine, spruce, birch, hazel, alder, lime and oak are constructed with age estimates for the sites.

RESULTS

The **pollen diagram** (*left*) shows a high presence of birch, hazel and alder (green), with alder being the dominant species. Between 4200 and 3700 y. cal. BP, alder reaches a low point, while birch, oak (yellow) and hazel are at a peak. Pine and spruce (dark green) are present throughout the years, until both decline in the recent past. Lime (yellow), which has been present since 4400 y. cal. BP, shows a similar decline.

The **macrofossil histogram** (*below*) shows a high presence of birch, along with samples of pine and spruce and also aspen and oak.



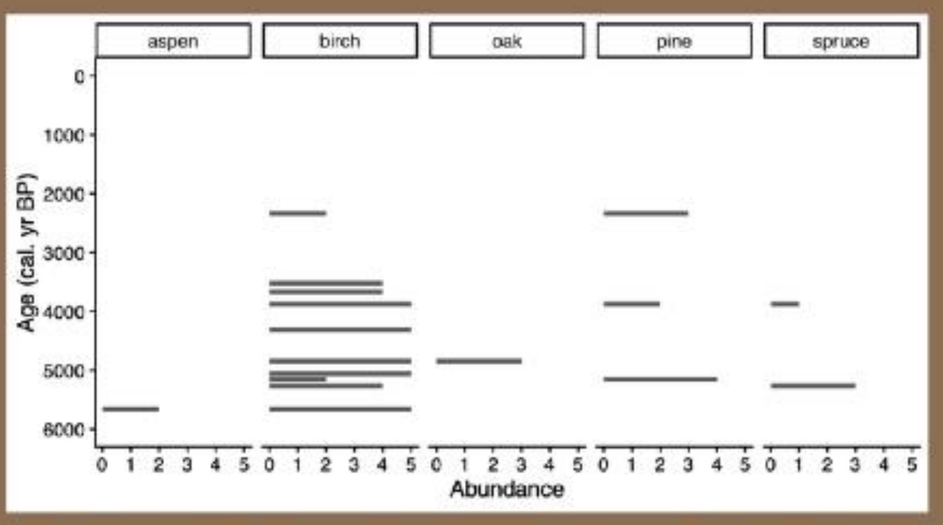


Figure 2: Macrofossil histogram Lygra. Each line represents the abundance of a tree species found in the macrofossil sample from a certain depth (abundance was measured from 0 = not present, to 5 = very abundant).

CONCLUSION

- Both **climate** and **human impacts** influence tree species diversity on Lygra
- **Warmer** and **less disturbed** conditions might have **favoured pine**, explaining decline after 4000 cal. y. BP.
- **Colder** and **more disturbed** conditions might have favoured birch

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References: Bjune et al. (2005). Heathlands – land-use, ecology and vegetation history as a source for archaeological interpretations.; Fremstad, E. (1983). Role of black alder (Alnus glutinosa) in vegetation dynamics in West Norway.; Hjelle, K. L. et al. (2010). Heathland development and relationship between humans and environment along the coast of western Norway through time. Kaaland P. E. (2014). Heathlands – land-use, ecology and vegetation history as a source for archaeological interpretations.