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Branch age and diameter: useful criteria to recognize woodland management in the present and past?

Often assumed in archaeological material: woodland management (pollarding/coppicing). Can we prove it?

**Assumption:** branches in managed trees have better access to light and experience less competition than in unmanaged trees, resulting in accelerated growth, long straight branches and increased wood production.

**Method:** analysis of the diameter and age of branch wood. Models for unmanaged and managed wood have been developed (figure 1a) and tested with modern-day data. A version with diameter selection is also presented (figure 1b).

**Results of modern-day trees study:** willow

**Figure 2:** diameter- and age-distribution, and age/diameter scatter plot of unmanaged and managed willow (*Salix*) in the Netherlands and Denmark. The age distribution of managed wood ends abruptly.

**Conclusion:** the scatter plot shows large overlap in the small diameters, but in the diameters larger than 2 cm distinction is possible.

**Application to archaeological data:** two examples

**Figure 3a:** data of fish traps from Late Neolithic Emmeloord (van Rijn) made of willow (*Salix*), plotted in the modern-day data. It concerns young, thin branches, so age/diameter analysis does not allow conclusions about management, but diameter selection is clear.

**Figure 3b:** selection of data of willow (*Salix*) and hazel (*Corylus*) wickerwork in Early Medieval Coppergate, York, kindly made available by Dr. A. Hall, plotted in the modern-day willow data. Willow comes from unmanaged trees, selected for their diameter. The results from this hazel selection seem to point exceptionally to the use of managed trees, but modern-day data are needed for this taxon.

**Conclusions**

The modern-day age/diameter data confirm that distinction is possible between managed and unmanaged wood. The pattern is clearest in the scatter plot, small diameters excluded. Large, narrow peaks in archaeological age/diameter datasets may be explained by diameter selection.

**Recommendation for archaeological studies:** large sample sizes, plotted per taxon (N≥100), diameters >2 cm.

See the handout for extra information!

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**fig. 1a** Models for managed and unmanaged wood

**fig. 1b** Models with diameter selection

**fig. 2** Data on managed and unmanaged willow

**fig. 3a** Willow from Late Neolithic Emmeloord (van Rijn) plotted in willow data

**fig. 3b** Willow and hazel from Early Medieval Coppergate (Hall) plotted in willow data