

Palaeoclimate and fossil woods—is the use of mean sensitivity sensible?

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The growth rings of fossil wood provide valuable data on tree ecology. As many of the parameters controlling width are climatic, it is tempting to use these rings as an indicator of climate. This is what has been done, with great success, by dendrochronological studies of archaeological wood. For wood dating from before the Pleistocene, however, the task is more uncertain. Since around 1980, researchers have relied mainly on a statistical parameter, the mean sensitivity, an average of the difference in width between two consecutive rings. However, there has never been a critical examination of utility and significance of this parameter for fossil wood. I compiled 63 studies that used mean sensitivity for palaeoclimatological inferences. An analysis of this compilation is presented here. Despite its ups and downs since the 1980's, mean sensitivity is increasingly used by palaeobotanists. However, it has been used in very different ways. The values obtained for the same fossil can vary greatly from one researcher to another, but also according to the radii of the woody axis considered. Within fossil wood assemblages, average sensitivity varies widely, but rarely consistently. Overall, mean sensitivity values are continuously, normally and unimodally distributed, and therefore are unsuitable for characterising discrete climate classes. Finally, it seems that the most recent studies are also the least cautious when it comes to interpreting the values obtained.

Key words: Climate proxy, growth ring, palaeobotany, palaeoecology, tree.

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