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[L] Competition in mixed *Pinus silvestris* L. and *Quercus pubescens* Willd. stands in Valais, Switzerland

Inter- and intra-specific competition in mixed stands of Scots pine (*Pinus silvestris* L.) and pubescent oak (*Quercus pubescens* Willd.) were investigated to better understand the pine decline in the Swiss Rhone valley. The aim was to predict the role that deciduous trees will play in these low-elevation pine-forests in the future.
Besides climatic signals, tree-ring patterns contain information about the individual conditions in which a tree has been growing, including competition. Using dendrochronological methods, we traced the growth dynamics of 500 pines and oaks for the last decades and compared the growth levels of neighbouring trees. The sampled trees belong to 15 stands for which stand dynamics and changing competition regimes were reconstructed. For the analyses, we compared growth trends of pines and oaks on three organisational levels: whole-stand, social class and individual tree. While many pines showed low tree-ring width during the most recent period, some oak trees had increased their actual growth. This observation can be interpreted as an increase in competitive strength of oak, which results in an increasing suppression of pine. To study the competition regime for every single tree, several competition indices were applied.
In a further step, negative pointer years and subsequent recovering phases were distinguished. Although in some extreme (drought) years all the trees were affected seriously, in other years pines faced a stronger growth reduction than oaks, or vice versa. The differences in the occurrence of pointer years were found to be caused partly by species-specific seasonal growth-strategies. Furthermore, oak usually returned faster to the pre-event growth level than pine. The lag effect in the recovery of pine can be explained by a reduced photosynthetic activity because of needle loss following drought.
Our results suggest that successional dynamics towards deciduous stands are occurring in these low-elevation pine forests.

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[P] Comparison of earlywood width, latewood width, and total ring-width measurements in oak

Oak has been utilized in constructions for its high strength and durability and is therefore often found in historical buildings or archaeological excavations. Oak is also a prominent species in stable isotope studies to understand better climate variability. Due to the ring-porous structure of oak and the limited number of water conducting tree-rings, earlywood width and vessel sizes have been considered in determining climatic-growth relationships. As earlywood is mostly formed with reserve-carbohydrates from the previous year the question of how much information is preserved in the earlywood-width carries information is obtruding.
Oak samples from two different sites were measured for earlywood-, latewood- and ring-widths. We also compiled the so-called "transfer ring width", which is defined as the latewood-width of the current year$_t$, plus the earlywood-width of the following year $_{t+1}$. Descriptive basic statistics of the four series was calculated and individual chronologies were built with the different parameters.
The highest mean series-intercorrelation and mean sensitivity was observed for latewood

width. The calculated "transfer ring width" did not show major an improvement. The cross-dating of oak was statistically more significant with latewood-width compared with total ring-width.

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[L] Extension of the Hinoki tree-ring chronology and possible climate reconstruction for the last millennium in Japan

Monsoon plays a key role in climatic variability in East Asia. Japan locates at a the Asian monsoon front that divides the coastal mid-latitude Asia into two climatic regimes; the area to the north-west of the front is under a strong influence of the Siberian (continental) air mass, whereas the area to the south-east is governed by the Pacific (oceanic) air mass. We have developed the tree-ring chronology (ca. 250 year long) of the modern living trees of Hinoki cypress (Chamaecyparis obtusa), with which the early spring temperature can be reconstructed. The extension of the chronology is undertaken using dead trees that are buried or straddled by living trees (ca. 300 years old). The samples were crossdated simultaneously by visual and statistical assessment on the computer screen. Unfortunately only a few dead samples were possibly crossdated by the modern chronology. However, the resulting chronology spans 1012 years at the sample depths of 8 where the value of expressed population signal exceeds 0.85. AMS radiocarbon dating was performed for some dead samples. The radiocarbon dates were dendro-calibrated using INTCAL98 (Stuiver et al., 1998). The gap of the chronologies was estimated to be ca. 120 years around the late 16th or 17th century.

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[P] Dendrochronological dating of the historical sites in Old Riga

The Latvian capital Riga (founded in 1201) is among those cities whose historic centre has a thick (3–8 m), damp, organic-rich cultural layer, so that historic wood has been preserved up to the present day. Large and medium-sized historic wooden structures have been found here, and in places these are still coming to light: the remains of wooden buildings and spreads of logs that served as street paving (12th–14th cent.), the foundations of timber-frame and masonry houses (13th–19th. cent.), as well as waterfront revetments and elements of them (13th cent. up to the present day). Smaller wooden structures have also been discovered (timber-lined wells, historic ship remains, etc.). The logs incorporated into extant buildings in Riga cover the period from at least the 17th century up to the present day.

In the period up to the mid-1990s, when systematic dendrochronological study began of historic wood in Latvia, the wooden structures at archaeologically excavated historical sites in Old Riga had not been dated, or else most of the wood samples had been lost. During the past 10 years, at the Dendrochronology Laboratory of the Archaeology Department, Institute of History of Latvia, a collection of historic wood from Riga has been created anew. So far, absolute dates have been obtained by dendrochronology for six historic sites in Riga. These cover the period from the 13th up to the 18th century. The results of comparison between the chronologies obtained confirm written historical evidence that up to the 14th century mainly pine timber felled in local forests was used in the buildings of Riga, while in later centuries building timber was supplied mainly along the River Daugava, from the upper reaches of the river and even from more distant areas.

Comparison of earlywood-width, latewood-width and total ring-width measurements on oak (*Quercus petraea* Liebl.)

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Samples were taken from dry sites in Lower Austria and Vienna (**fig. 1**).

GWW	Glasweiner Wald	48°32‘53“N, 16°15’18“E, 320m,
PBG	Praunsberg	48°27‘58“N, 16°17’57“E, 250m,
DSW	Dunkelsteiner Wald	48°19‘50“N, 15°25’50“E, 650m,
LZT	Lainzer Tiergarten	48°11‘28“N, 16°12’26“E, 300m,
PER	Perchtoldsdorf	48°07‘12“N, 16°14’14“E, 430m

Earlywood- (**EW**) and latewood-width (**LW**) were measured separately. Ring-width (**RW**) was calculated by addition of $EW_t + LW_t$. Alternatively “transfered ring-width” (**TRW**) was calculated by addition of $LW_t + EW_{t+1}$ (**fig. 2**).

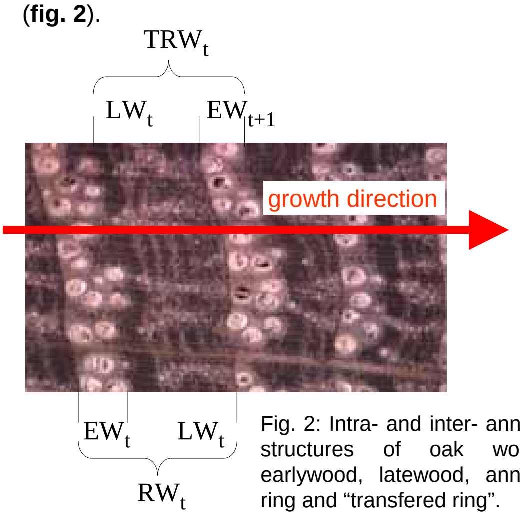

Fig. 2: Intra- and inter- annual structures of oak wood: earlywood, latewood, annual ring and “transfered ring”.

Tab. 1: Statistical values calculated with “cofecha”

GWW	corr master	mean sens	auto corr	m seg len	trees
EW	0.299	0.212	0.509	113	14
LW	0.651	0.349	0.555	113	14
RW	0.635	0.244	0.603	113	14
TRW	0.597	0.274	0.546	112	14
PBG					
EW	0.314	0.229	0.445	125	12
LW	0.628	0.385	0.504	125	12
RW	0.615	0.256	0.596	125	12
TRW	0.609	0.293	0.519	124	12
DSW					
EW	0.337	0.192	0.256	158	12
LW	0.769	0.494	0.620	158	12
RW	0.758	0.295	0.629	158	12
TRW	0.738	0.301	0.619	157	12
LZT					
EW	0.256	0.184	0.549	180	21
LW	0.619	0.301	0.626	180	21
RW	0.607	0.198	0.681	180	21
TRW	0.534	0.208	0.648	179	21
PER					
EW	0.353	0.188	0.438	158	10
LW	0.755	0.360	0.593	158	10
RW	0.753	0.213	0.625	158	10
TRW	0.677	0.225	0.584	157	10

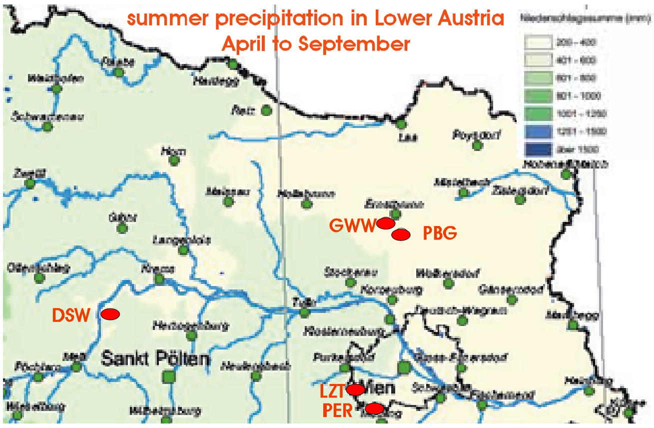

Fig.1: Sites sampled in Lower Austria and Vienna; © map: ZAMG

Figure 3 shows the mean-curves (EW, LW, RW and TRW) for DSW. Minor differences between RW and TRW are evident. The main influencing factor is LW; EW seams to be constant.

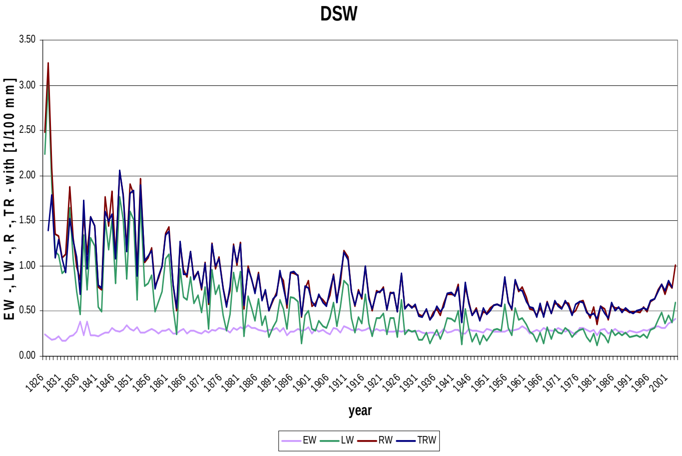

Fig. 3: EW-, LW-, RW- and TRW- curves from DSW

LW shows the highest values for “correlation to master” and ”mean sensitivity” (**tab. 1**). TRW did not improve the statistical values. EW was always the worst parameter.

Due to high statistical values of LW, we recommend to use LW instead of RW, if it is possible to observe LW.

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