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Coping with Central European climate – xylem adjustment in seven non-native conifer tree species

Supplementary Material

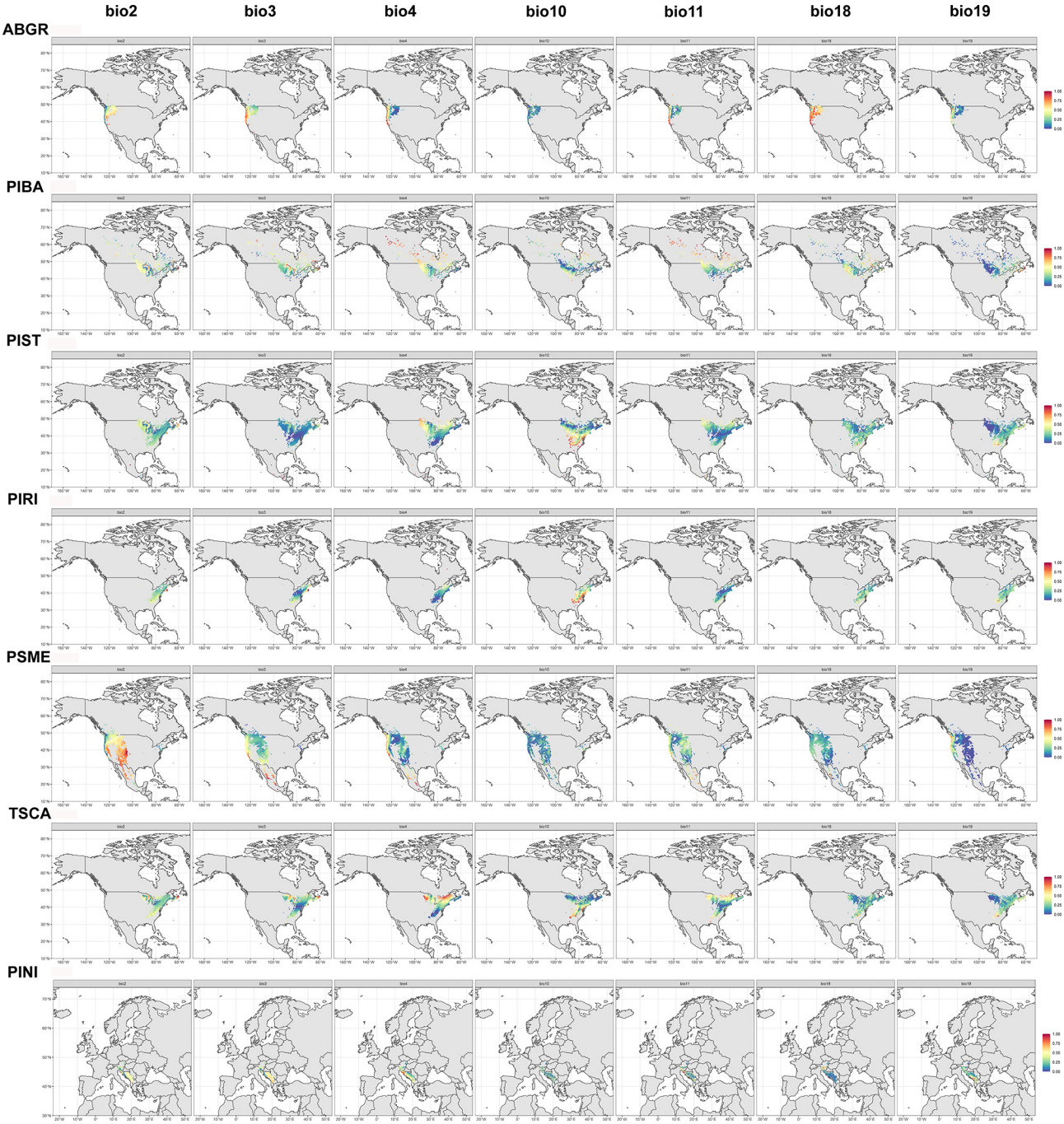

Fig. S1. Climate compliance maps with bioclimatic parameters for natural distribution of NNTs, where a value of 0 corresponds to full compliance with study site conditions. The data refers to absolute value of the difference between the study sites and each location from the natural range of NNTs, standardized with the x/range transformation method (Walesiak & Dudek, 2020). Selected bioclimatic parameters for the period 1979–2013 from the Chelsa database with a spatial resolution of 30 arc seconds: bio2 – mean diurnal range of temperatures averaged over 1 year [°C], bio3 – ratio of diurnal variation to annual variation in temperatures, bio4 – standard deviation of the monthly mean temperatures, bio10 – mean daily mean air temperatures of the warmest quarter [°C], bio11 – mean daily mean air temperatures of the coldest quarter [°C], bio18 – mean monthly precipitation amount of the warmest quarter [kg m^{-2}], bio19 – mean monthly precipitation amount of the coldest quarter [kg m^{-2}] (Karger et al., 2017). For species IDs see Table 1

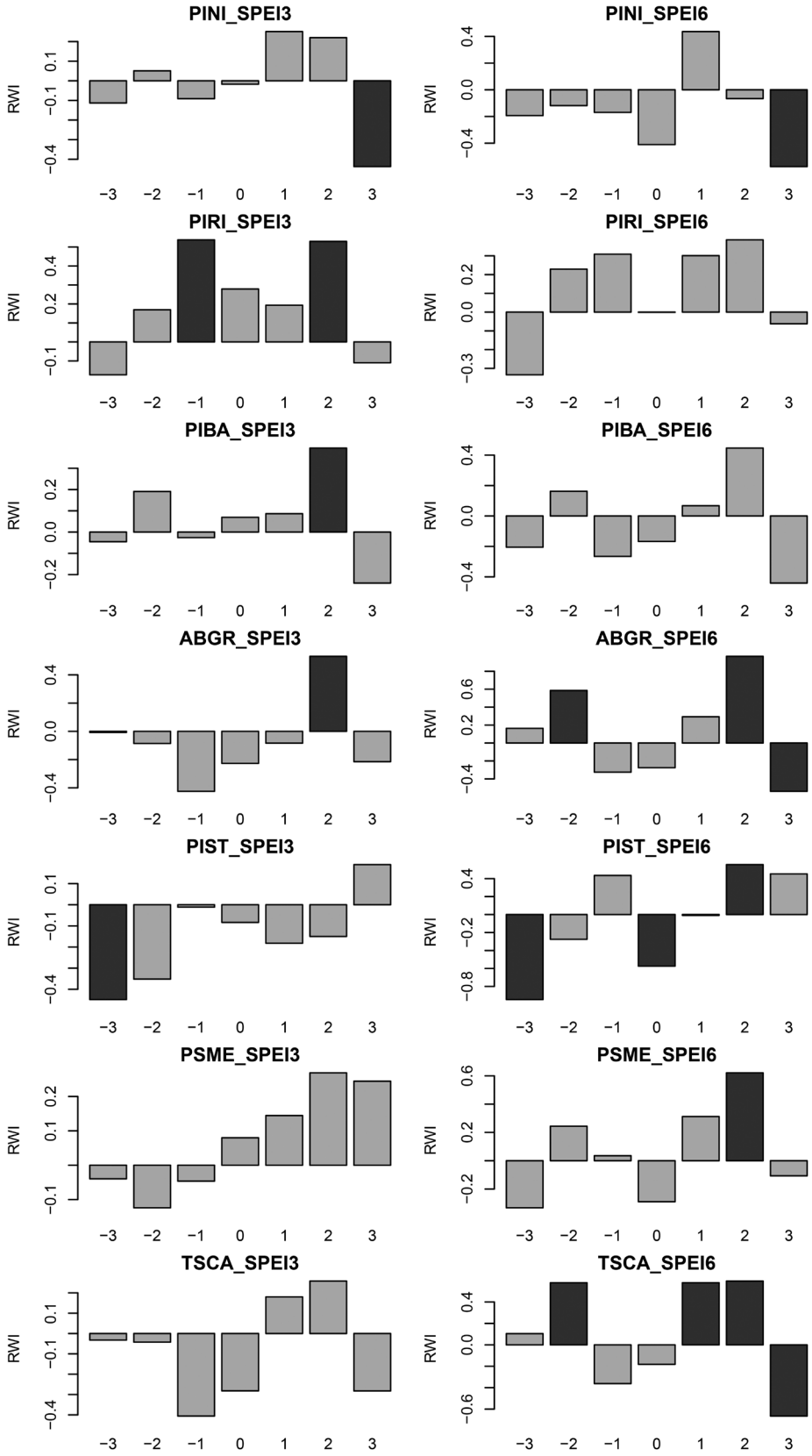

Fig. S2. Superposed Epoch Analysis showing negative and positive tree growth departures (residual species chronologies) for the severe drought year (SPEI < -2) and 3 years before and after the drought events. Bar graphs for severe drought events characterised by SPEI3 (left panel) and SPEI6 (right panel). The grey and dark grey bars denote significance ($p<0.05$ and $p<0.01$) of the departures from the RWI. The X axis shows the period of three years preceding and following the event year. For species IDs see data Table 1

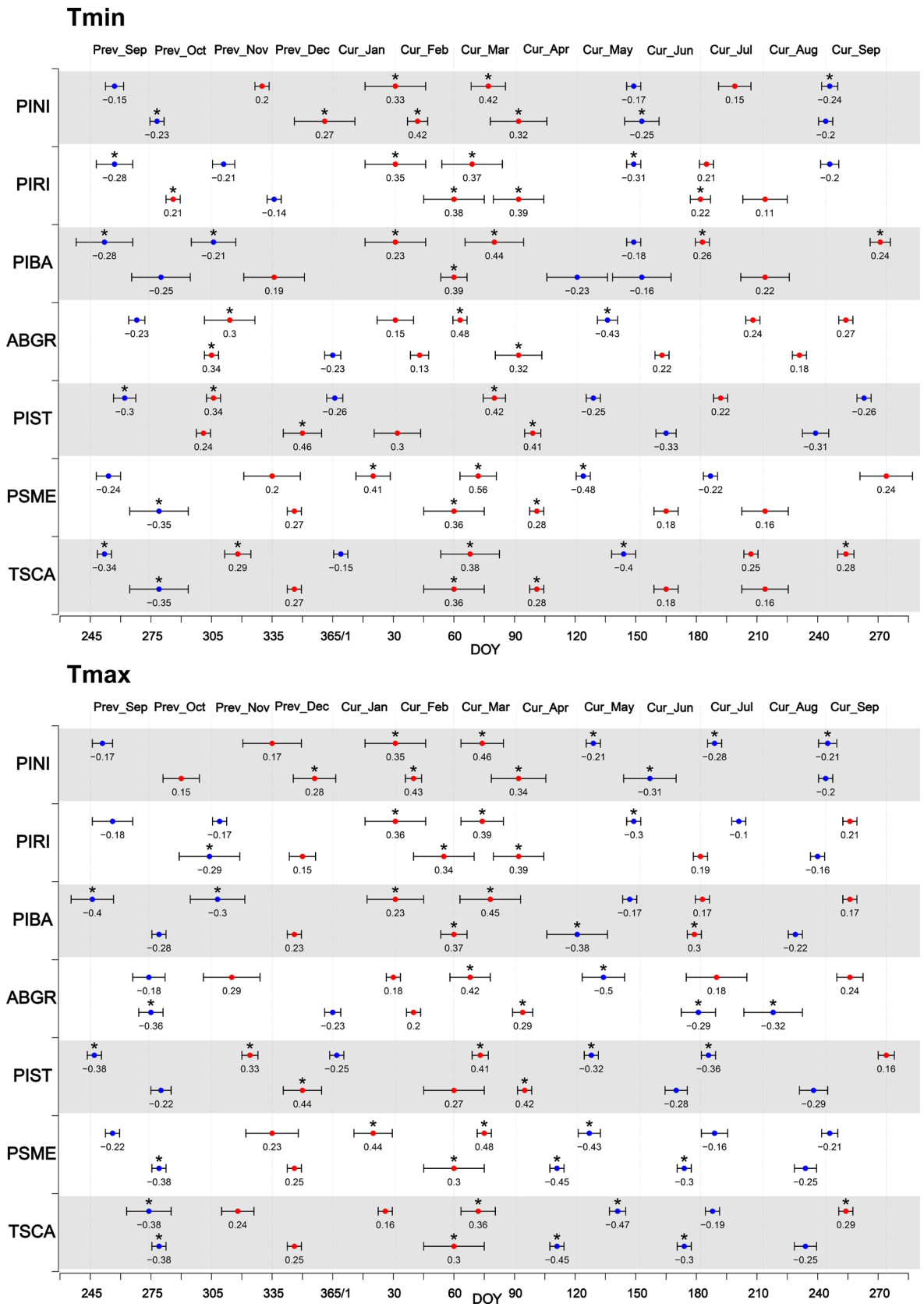

Fig. S3. Species-specific climate-growth relationships based on daily climate data. 14 – 60 day moving window correlations: between tree-ring width index (RWI) and minimum temperature (upper panel) and maximum temperature (bottom panel). Red dots – positive correlations, blue dots – negative correlations, * demarcate a significance level of correlation ($p < 0.05$), horizontal whiskers demarcate window length, maximum correlation coefficient value shown below each whisker. For species IDs see data Table 1

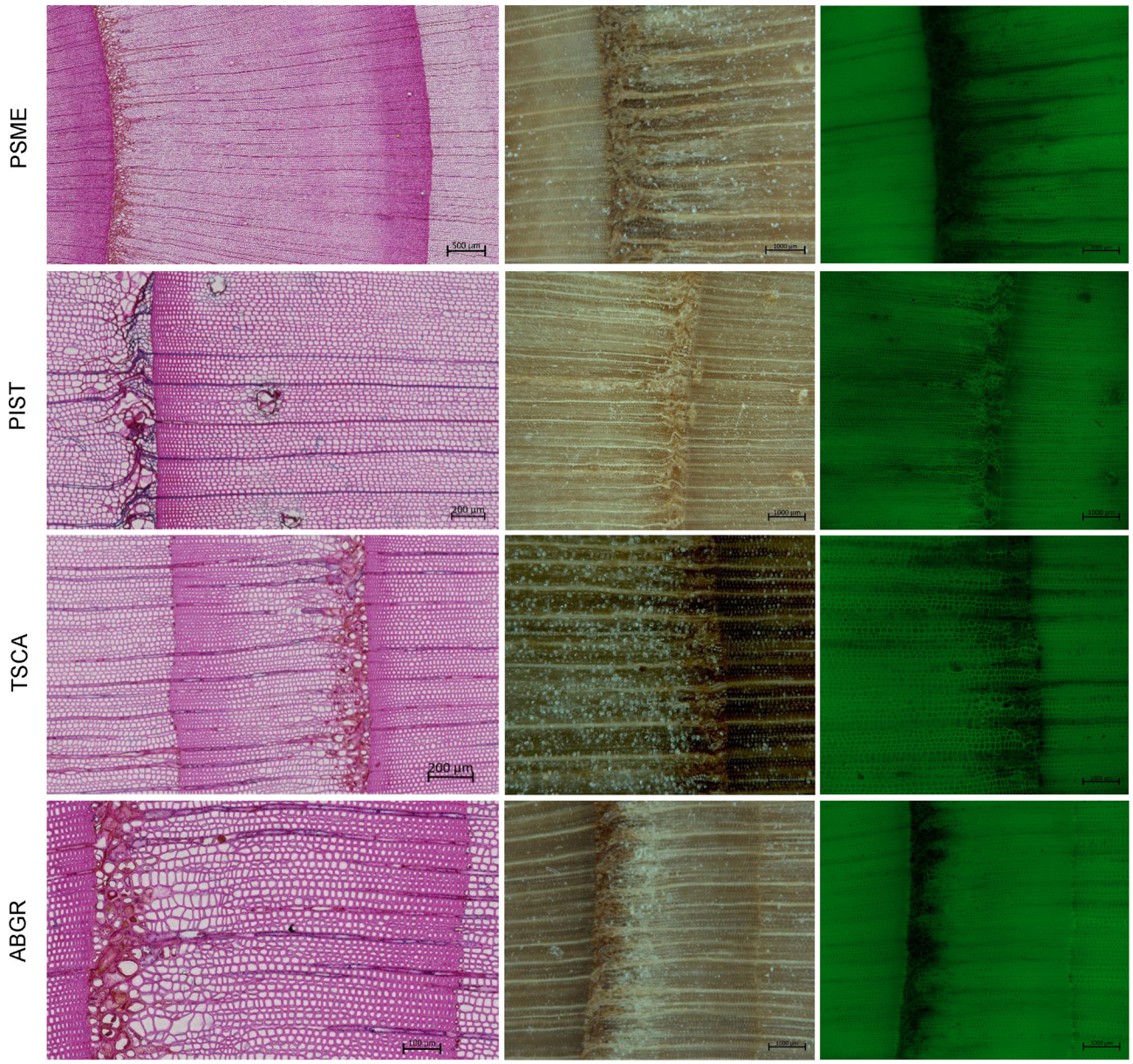

Fig. S4. Examples of frost rings (FR) identified in PSME, PIST, TSCA, and ABGR. Double-stained, 12-14 µm thick cross-sections (left column), cross-section from increment core - ZEISS Axiozoom.V16 stereoscope with bright light (middle column), cross-section from increment core - ZEISS Axiozoom.V16 stereoscope with green fluorescent light, wavelength 488 nm (right column). Scale for each image in the lower right corner. For species IDs see data Table 1

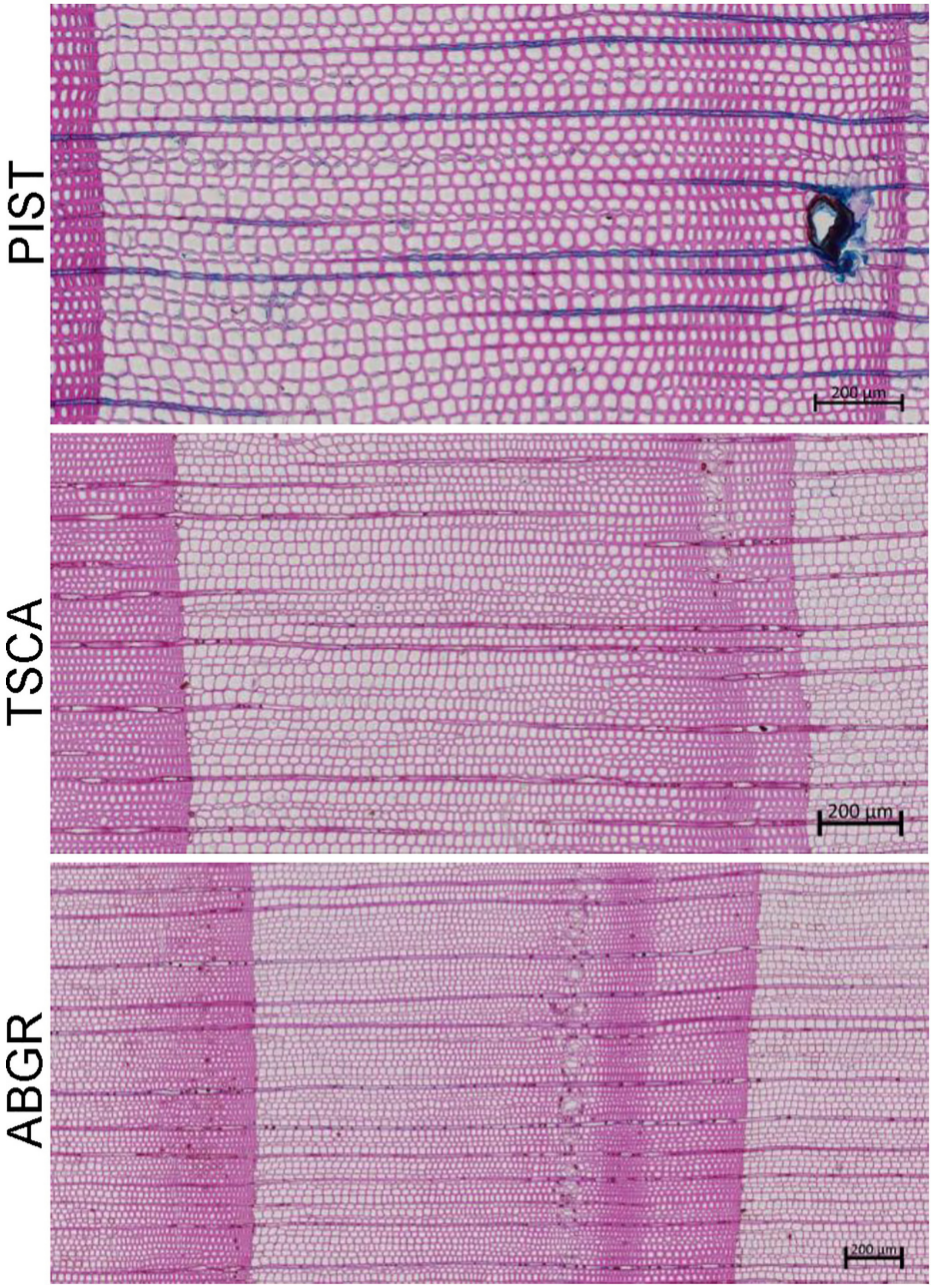

Fig. S5. Examples of intra-annual density fluctuations (IADF) identified in PIST, TSCA, and ABGR. Double-stained, 12-14 µm thick cross-sections, scale for each image in the lower right corner. For species IDs see data Table 1