
Tree-Rings to Climate relationships in *Pinus nigra* Arn at Souiniet experimental site in Northwestern Tunisia.

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Abstract

Black pine is very widely distributed and is one of the most commonly used pines in large plantations throughout the Mediterranean region. This makes it very susceptible to the increase in temperature and decrease in precipitation already observed for the region and predicted by climatechange models. In Tunisia, for the sake of guiding species selection for future reforestation in Khroumirie Mountains, research studies are under way to further knowledge of the ecology of black pine. The aim of our study is to evaluate ring-width to climate (temperatures and precipitation) relationships of four black pine subspecies introduced atSouiniet arboretum (NW Tunisia, 492m) under humid Mediterranean bioclimate. Statistical parameters commonly used in dendrochronology were calculated from ring-width data. Mean ring-widths show the highest growth for *P. nigra* subsp *pallasiana*, *Salzmannii*. Mean sensitivity is highest in *P. nigra* subsp.*nigricans*. Then, tree growth to climate correlations were calculated using monthly maximum, minimum temperatures and total precipitation data collected from Ain Drahem meteorological station (1969-2013). We found a significant positive correlation with April precipitation and a significant negative correlation with spring temperature. It seems that cool and wet spring sare beneficial to growth as they affect strees water balance at the onset of the growing season, so, spring drought is responsible for low annual growth. January–February temperatures have a positive influence on ring-width as mild winters may foster photosynthesis and promote an early resumption of cambial activity. Pointer years analysis showed that winter snow is a major limiting growth factor of *P. nigra*.

Keywords: *Pinus nigra* Arn, tree, ring chronologies, climate, precipitation, temperatures

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