

Tree ring investigation of alder posts from the foundations of the Vilnius royal palace

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The cultural layer of the Vilnius Lower Castle territory has been accumulating at least since the end of the 13th century. It is rich with remnants of different wooden constructions. For centuries the main tree species used in wooden constructions (houses, pavements, wooden frameworks under masonry constructions, etc.) was pine (*Pinus sylvestris* L.). But there was a period in the territory development when black alder (*Alnus glutinosa* Gaertn.) timbers were used in large amounts. Investigation of wooden frameworks from under building basements has revealed that alder timbers were used for some phases of the Royal Palace, the palace premises and the wall north of the palace construction.

Four groups of alder logs from different constructions were dendrochronologically analysed. All logs were with bark. Less than 60 years old trees were used for posts and frameworks in C basement in SE wing of the palace and for posts under the wall north of the palace. Together with younger than 50 years old trees, alders of 70-100 years old were used for W basement in NE wing of the Palace and the third premise. The oldest tree had 106 annual rings.

Relative cross-dating of ring width series of alder logs has demonstrated that W basement of the Palace and the third premise were built almost contemporary. The trees for W basement were felled in winter of relative 91/92 year – May of 92 year. The trees for the third premise foundation were felled in the autumn – winter of relative 92 / 93 year. A floating 106 years long alder chronology, relatively dated -13 to 92, was constructed using tree ring series of these two groups.

The alder logs for the foundation of the wall north of the palace were felled two years later than the logs for C basement in SE wing of the Palace. Cross-dated ring width series of these two groups were the basis to build a 54 years long chronology. The chronology shows the best agreement with the former 106 years long chronology in a relative position 8 to 63.