

Dendrochronological dating of Transcarpathian churches transported to the Czech Republic

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Introduction

In the 1929-1936 five wooden churches from Transcarpathian region were transported to the Czechoslovakia (Figure 1). All of the churches were built from oak wood. The exact construction dates of all Transcarpathian churches transported to the Czech Republic are unclear and differ in literary sources.

Aims

The main aim of this project was dendrochronological dating of, preferably original, timbers from the churches. The further aim was to compare measured mean oak tree-ring width (TRW) series with oak standard TRW chronologies from Romania, Slovakia, Poland and Ukraine and to find out the influence of geographic position towards the Carpathians on the TRW.



Figure 1. Original (in Transcarpathian Ukraine) and current location of 5 churches transported to Czech republic in 1929 – 1936.

No. in Picture 1	Site + building	Sample no.	Type of construction	Dated by chronology	End year	Dating
1.	Prague - St. Michael the Archangel's Church	4	Boyko's (baroque) type	Slovakia (Prokop 2016)	1720	After 1726
		7A			1725	1726 - 1743
		11A			1721	After 1728
		11B			1719	After 1731
2.	Nová Paka - St. Nicholas's Church	1	Boyko's (baroque) type	Slovakia (Prokop 2016)	1753	1754/1755
		7			1751	1752/1753
		9			1735	1752/1753
		10			1738	1744 - 1763
		13			1708	1719 - 1733
14	1740	1753 - 1773				
3.	Kunčice pod Ondřejníkem - St. Prokop and St. Barbora's Church	5	Boyko's (baroque) type	Slovakia (Prokop 2016)	1776	1782 - 1794
		8			1754	After 1780
		14			1748	After 1768
4.	Dobříkov - All Saints' Church	4	Hutsul's (Gothic) type	Romania (Nechita 2018)	1646	After 1652
		6			1638	After 1644
		7			1630	After 1636
		10			1599	After 1608
		3			1616	After 1628
		8			1597	After 1604
9	1628	After 1634				

Table 1. Dendrochronological dating of tree-ring width series

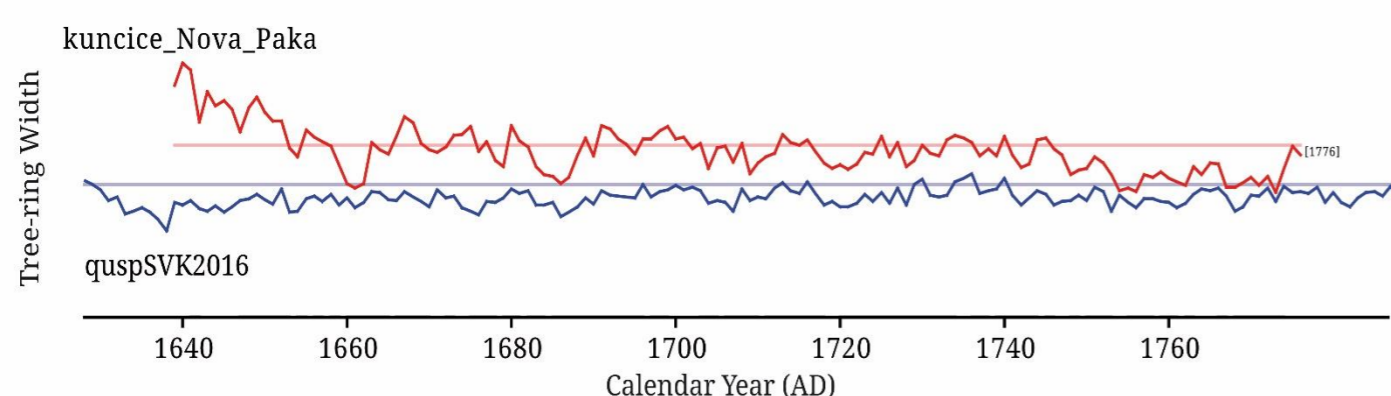


Figure 2. Synchronization of mean TRW series Nová Paka+Kunčice pod Ondřejníkem (red) and Slovakia oak standard chronology (blue)

Conclusion

Churches could be divided to two groups: 1) The churches from Mukachevo region (baroque type) which were dated according to Slovakia oak standard chronology and 2) The church from Chust region (gothic type), which was dated according to Romania oak standard TRW chronology. Except for mean TRW series from Nová Paka and Kunčice nad Ondřejníkem (both the baroque type) (Figure 2), no similarity among mean TRW series is reliable. These facts indicate, that in this region two regional oak TRW chronologies (Mukachevo and Chust region) should be compiled. Further, the fact that none of TRW series reported any similarity with Lviv chronology, presumes that influence of Carpathian Mountains on oak annual increments is enormous. Obtained oak TRW series will be used as foundation of new oak standard TRW chronology for Transcarpathian region.

Material and methods

Totally 63 samples (from 10 to 16 samples from each church) from different wooden construction elements of 5 Transcarpathian churches transported to the Czech Republic have been taken using Pressler increment. Samples have been measured using a VIAS TimeTable measuring system (© Sciem). All TRW series were synchronized and cross-dated using PAST4. The degrees of similarity among tree-ring curves were assessed using t-tests, the Gleichläufigkeit and a visual comparison of the TRW series (Table 1-2 and Picture 2-4). Four mean TRW series were assembled from TRW series which significantly correlated with each other (Table 2). The mean TRW series from each church were dated according to the standard oak TRW chronologies from Slovakia and northern Romania (Maramureş region) (Figure 3-4).

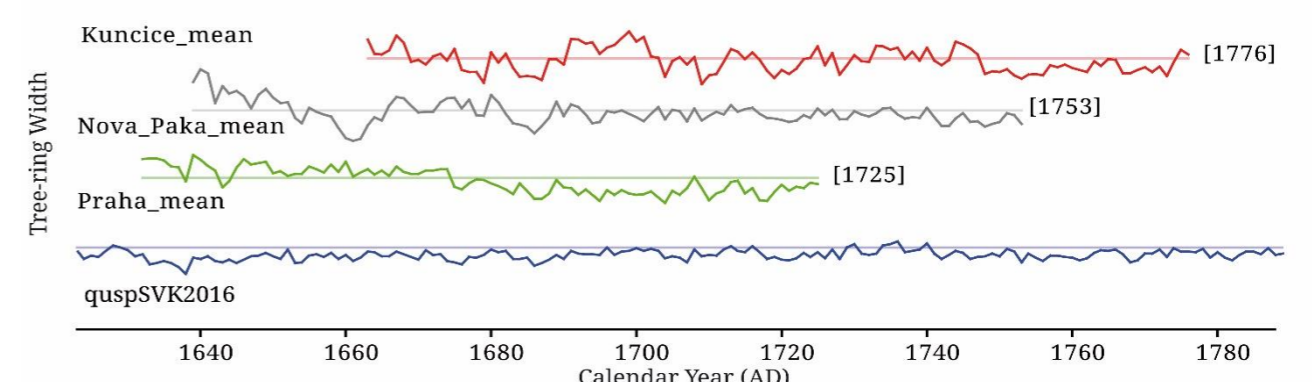


Figure 3. Synchronization of mean TRW series Kunčice pod Ondřejníkem (red), Nová Paka (grey), Prague (green) and Slovakia oak standard chronology (blue)

No. in Picture 1	Site	Chronology	T-test (B&P)	T-test (H)	Gleichläufigkeit	End year
1	Prague	Slovakia	5,28	5,29	65,4	1725
2	Nová Paka	Slovakia	6,04	6,63	71,3	1753
3	Kunčice pod Ondřejníkem	Slovakia	6,23	6,69	71,1	1776
4	Dobříkov	Romania	6,70	8,69	67,4	1646
3+4	Nová Paka + Kunčice pod Ondřejníkem	Slovakia	7,20	7,25	67,4	1776

Table 2. Dendrochronological dating of mean tree-ring width series

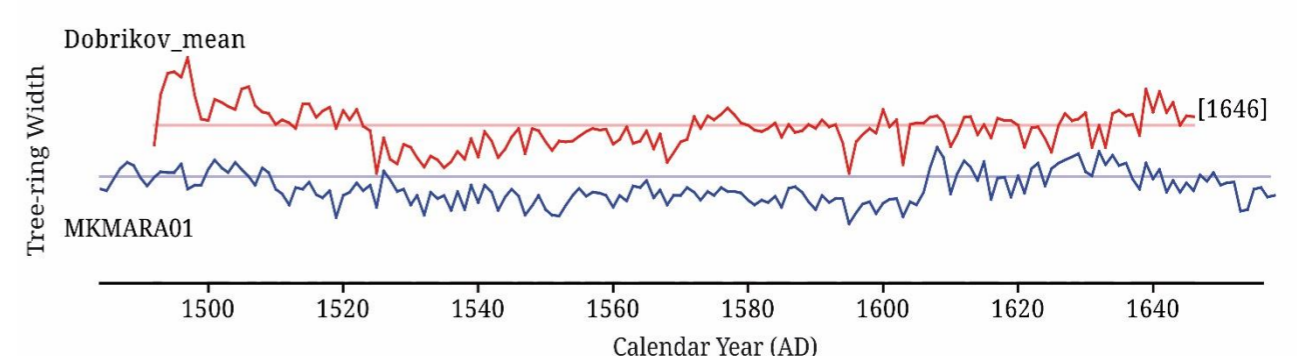


Figure 4. Synchronization of mean TRW series Dobříkov (red) and Romania oak chronology from Maramureş region (blue)

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