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BOOK OF ABSTRACTS

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SAPWOOD RINGS ESTIMATION OF SCOTS PINE IN LITHUANIA: PRELIMINARY RESULTS

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The estimation of the year of felling is one the aims of dendrochronology. However, very often the waney edge or entire sapwood rings are missing due to deterioration of wood or artificially removed because of weaker sapwood. This does not allow to establish a precise date of felling. Then, a reliable dating encompasses the estimation of missing sapwood rings. The simple technique has been to add the average number of sapwood rings for the species altogether with estimated confidence interval calculated from the distribution of sapwood rings. In case when all sapwood rings are missing, the reconstruction of the date of felling is not possible. Then, "terminus post quem" – "limit after which" is used, i.e. the latest measured ring with certainty. The number of sapwood rings of pedunculate oak, a species most often used in dating, is almost stable (Sohar et al 2012) and depends on geographical latitude and longitude. For, example the number of sapwood rings of oak varies from 6-18 in the three Baltic countries. However, Scots pine (*Pinus sylvestris* L.) is characterized by high and variable number of sapwood rings (Gjerdrum, 2013). For example, the average number of the sapwood rings of Scots pine is 51±15 in Europe, and depends on the cambial age of a tree (Gjerdrum 2013). The estimation of the sapwood rings of Scots pine was not investigated in Lithuania up to now. The aim of this study was to assess the number of sapwood rings of Scots pine in Lithuania under different tree age categories. For the purpose of the study, 674 living Scots pine trees were investigated up to now. The trees were cored in different regions of Lithuania from 1969–2016. The average age of the investigated pines is 99 years, the youngest tree – 34 and the oldest – 278 years old (Figure 1). The average number of estimated sapwood rings is 50±1.3. The preliminary results indicate much higher variation in sapwood rings between sites than in the same site, i.e. the number of sapwood rings of pine in Lithuania is site-specific. For example, the mean tree age in Žarėnai is 136±5 and the sapwood count 68±5, while the older pine site in Ešerinis (150±9 years) has less number of sapwood rings (61±5). Therefore, a large data set is needed in each age group to obtain the sufficient accuracy. In most cases, the confidence interval for mean decreases to < 5, when the number of investigated trees reaches more than 20-30 in each age group (Table 1). The data show that the desired accuracy is already obtained for trees within 31-130 years old. For trees older than 131 years, the more data is necessary to increase the data quality. However, due to limited availability of the very old living trees, there is a question about the possibility to compile a sufficient data set of trees older than 220

years. The work is ongoing and more trees will be analysed in the near future.

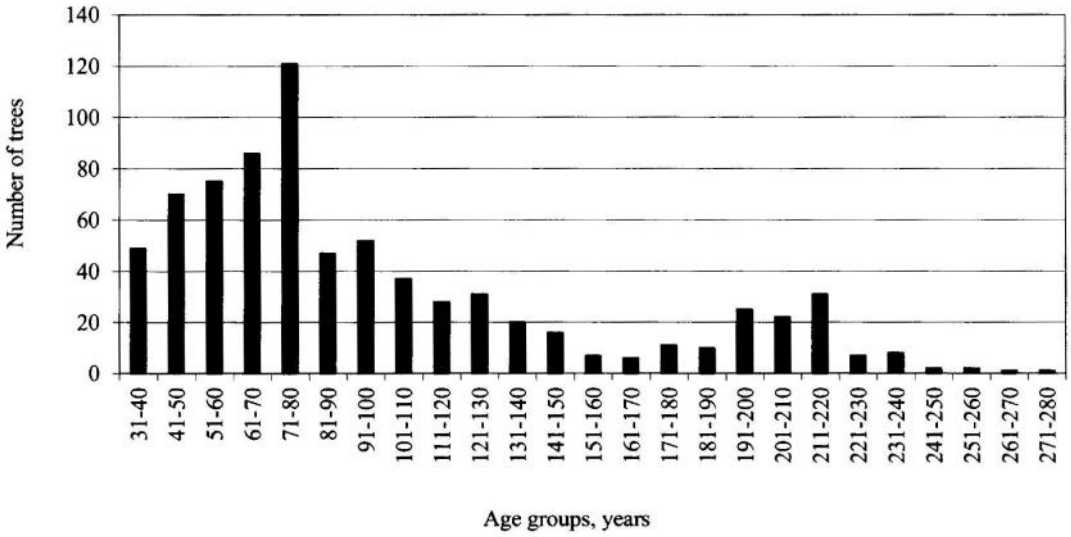

Figure 1. A histogram of the age groups of the investigated Scots pine trees.

Table 1. The average number of sapwood rings of Scots pine, according to the age groups

Age group	Sapwood rings	Confidence interval	Sample size	Age group	Sapwood rings	Confidence interval	Sample size
31-40	28	1	49	161-170	69	15	6
41-50	32	1	70	171-180	68	5	11
51-60	39	1	75	181-190	61	8	10
61-70	41	1	86	191-200	73	5	25
71-80	46	1	121	201-210	80	6	22
81-90	50	2	47	211-220	82	4	31
91-100	52	2	52	221-230	69	15	7
101-110	55	3	37	231-240	84	9	8
111-120	57	3	28	241-250	97	27	2
121-130	61	3	31	251-260	68	31	2
131-140	64	6	20	261-270	82	no data	1
141-150	59	5	16	271-280	119	no data	1
151-160	63	11	7				

Keywords: *Scots pine, tree rings, sapwood, dating.*

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