

Variability and relation of lignin, low molecular mass phenolics and cell wall bound peroxidases in the needles of Serbian spruce (*Picea omorika* (Pančić) Purkyně) during four seasons

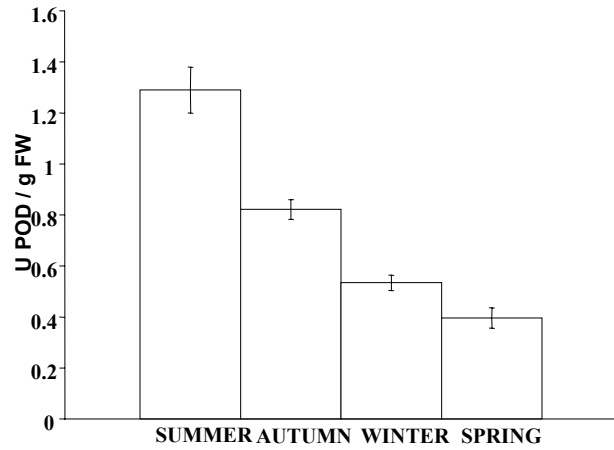
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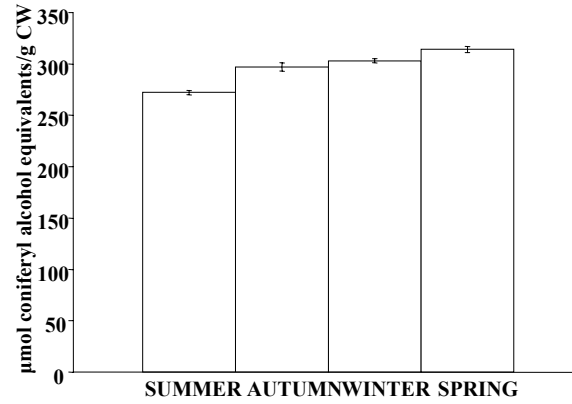
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Because of the large number of peroxidase isoforms and the nonspecific nature of these enzymes, it has been difficult to identify which peroxidase fraction and isoforms are responsible for lignin polymerization.

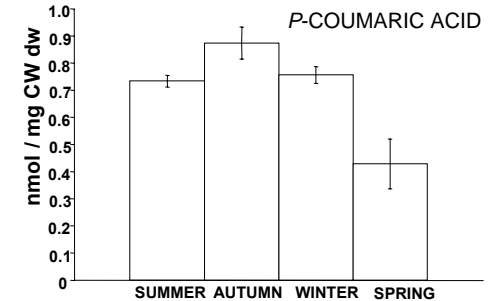
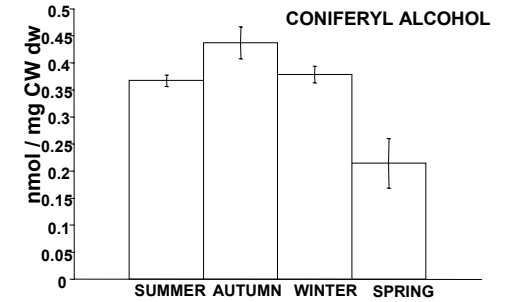
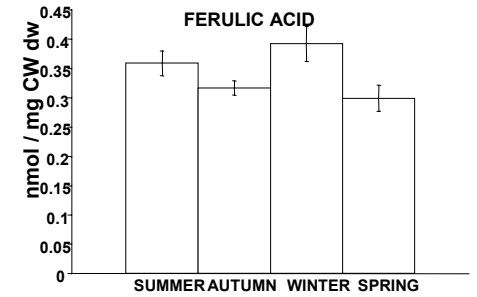
In this work, the aim was to study relations between activities of cell wall bound POD on one side and simple phenols and lignin content on the other, in various seasons.



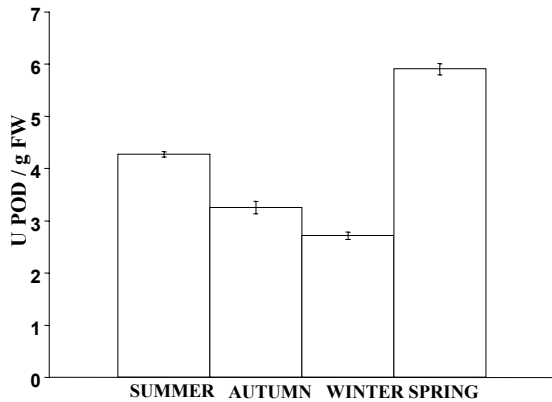
Variation in the activity of ionic peroxidase in *P. omorika* needles collected from Mt.Tara



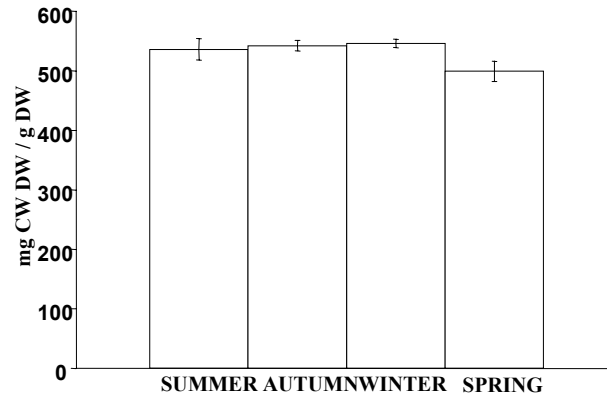
Lignin content in the needles of *P. omorika*, in different seasons



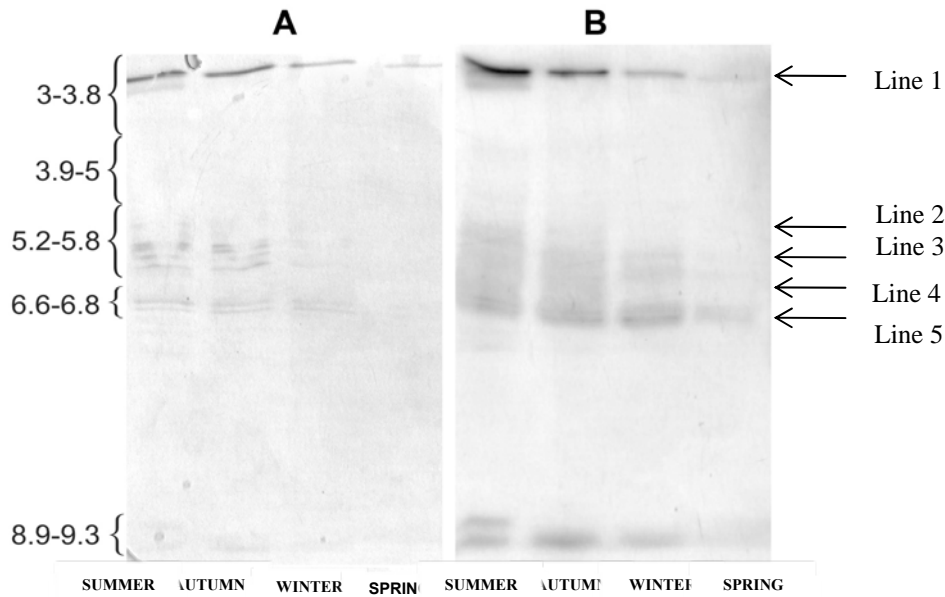
Coniferyl alcohol (CA), *p*-coumaric acid (*p*-COUM) and ferulic acid (FA) detected in the NaOH extract of cell wall



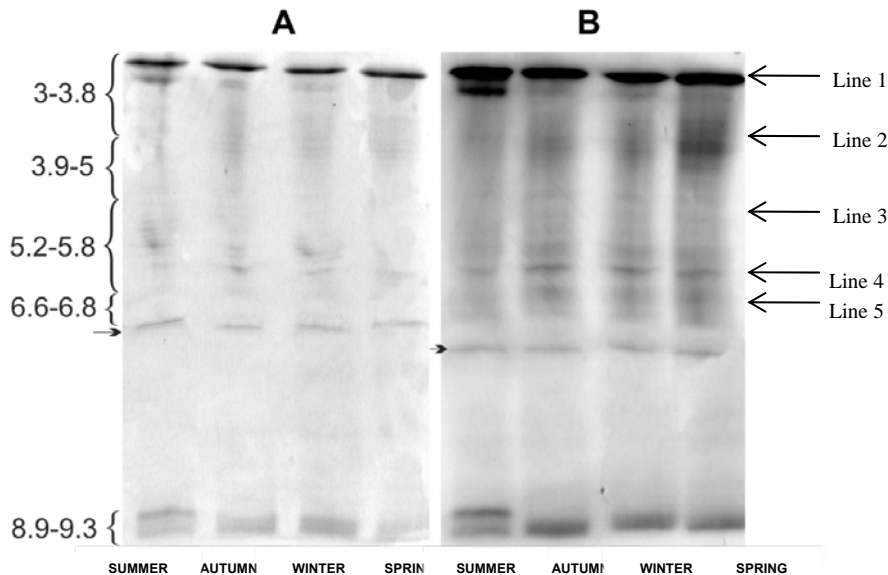
Variation in the activity of covalent peroxidase in *P. omorika* needles collected from Mt.Tara



Cell wall dry weight / needle dry weight (mg/g)



Seasonal variation in isoelectric patterns of ionic and covalent peroxidase fractions in *P. omorika* needles stained with guaiacol and 4-Chloro-1-naphthol



The contents of *p*-COUM and CA were positively correlated with the activity of ionic I2, I3 and I5 isoforms. The content of FA was in positive correlation with the activity of covalent L4 isoform. These results support hypothesis that certain ionic and covalent POD isoforms might be involved in formation of the cross-links between cell wall polymers in Serbian spruce needles.

Lignin content showed a significantly higher value in spring and a significantly lower value in summer in comparison with the other seasons

High lignin content in spring may reflect the beginning of a high metabolic activity in *P. omorika* in the vegetative season. A relatively high lignin content in autumn and winter in Serbian spruce needles shows that synthesis of this polymer continues also in these seasons