

Distribution of Hydrolysable Tannins in the Foliage of Finnish Birch Species

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On the basis of qualitative and quantitative analysis with liquid chromatography – electrospray ionisation mass spectrometry, the foliage of dwarf birch (*Betula nana* L.), silver birch (*B. pendula* Roth) and mountain birch (*B. pubescens* ssp. *czerepanovii* (Orlova) Hämet-Ahti) were found, for the first time, to contain the same individual HTs that were described earlier for white birch (*B. pubescens* Ehrh.). In addition, one previously unidentified ellagitannin was preliminarily identified from the leaves of white and mountain birches, being totally absent from the foliage of the other two species. There were large variations in the contents of HTs between species. Seasonal variation affected significantly the contents of some individual HTs within species, and these changes were mainly in accordance with the biosynthetic pathway of HTs. All species converted galloylglucoses (GGs) into ellagitannins (ETs), dwarf birch being the only one that's efficient ET synthesis resulted in seasonally increased contents of ETs and thereof total HTs as well. The presence of insoluble ETs as well as the absence of insoluble GGs was confirmed in all four birch species for the first time. Furthermore, the amounts of insoluble ETs per one birch leaf were found to accumulate during the growing season. These findings complemented our knowledge of the biosynthetic pathway of birch leaf HTs: from soluble GGs via soluble ETs into insoluble ETs. The possible role of HTs in the herbivore defence of these species is discussed.