



## NJF Seminar 399

### **Beneficial health substances from berries and minor crops –**

- How to increase their concentration in cultivated species, eliminate losses in processing and enhance dietary use

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## Cultivated sweet rowanberries have high phenolic content and antioxidant capacity

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Cultivation of sweet rowan was started in Kuopio in 1990 when various cultivars and hybrids adapted to northern climates were planted in the University Botanical Garden. The first cultivars were received from Polli Horticultural Research Center, Estonia. Cultivation of rowanberries has a long history in Russia and in Central Europe. The first sweet rowan cultivars had been selected from a wild population of rowan (*S. aucuparia* L.) in Sudety mountain area, currently part of Czech Republic, in the 19th century. Breeding of sweet rowans was started by the famous botanist, Ivan Vladimirovich Michurin in Russia more than a hundred years ago, resulting in a most interesting collection. The hybrid cultivars were developed by cross-breeding rowan with *Malus*, *Pyrus*, *Aronia* and *Mespilus*. We have analysed the berries of sweet rowan cultivars Burka, Dessertnaja, Eliit, Granatnaja, Kubovaja, Rosina, Rubinovaja, Titan and Zholtaja, grown in Kuopio, for their phenolic content and antioxidant capacity. The rowanberries were extracted with acidified 70% acetone. Total phenolics were measured with Folin-Ciocalteu method, and antioxidant capacity with FRAP and DPPH methods. Individual phenolic compounds were quantified by using HPLC. All the cultivars have high antioxidant and phenolic content. The total phenolic content varied between 550-1010 mg/100 g fresh weight in different cultivars. Anthocyanins (6-80 mg) were mainly found in berries of the hybrid cultivars. Of the other phenolics, chlorogenic (29-160 mg) and neochlorogenic (34-104 mg) acids constituted the major fraction in all rowanberries, the concentrations almost equalling those present in coffee. Antioxidant capacities of rowanberries were high, as measured with FRAP (61-105  $\mu\text{mol Fe}^{2+}/\text{g}$ ) and DPPH (21.3-9.7 g/g DPPH) methods. Principal component analysis was able to separate the cultivars of different origin into clusters based on their phenolic profiles. The phenolic profile and high antioxidant capacity make the rowanberries potentially very interesting sources of preservatives and colouring agents for the food processing industry.