NJF Report • Vol 3 • Nr 1 • Year 2007

Nordic Association of Agricultural Scientists

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

Piikkiö, Finland, 14-15 March 2007

Arctic bramble, berry with unique aroma is a rich source of phytochemicals. Cultivation is still problematic

Harri Kokko, Anne Hukkanen, Katri Kostamo, Paavo Markkula and Sirpa Kärenlampi. Department of Biosciences, University of Kuopio, P.O. Box 1627, FI-70211 Kuopio, Finland. Tel. +358 17 163375, Fax +358 17 163148, harri.kokko@uku.fi.

Arctic bramble (Rubus arcticus L.) is a northern Rubus species, which produces berries with unique aroma. The berries are very valuable and desired by gourmet restaurants as well as by liqueur industry. The natural habitats of this species have become rare due to changed farming and forestry practices, thus creating a demand for commercial cultivation. Arctic bramble is cultivated only in Finland although its natural distribution is wider, extending from Russia to Scandinavia. There is a need for several-fold increase of the cultivation area that is currently ca. three hectares. The cultivation has remained small-scale because of high annual fluctuations in the yield, mainly caused by downy mildew disease (Peronospora sparsa). At the University of Kuopio, a project "Menestystä mesimarjasta Pohjois-Savoon", funded by the Employment and Economical Development Centre of North Savo, was established to increase the cultivation area and to improve the commercial cultivation by e.g. improving cultivation techniques such as disease control, and by training and networking of local growers. The main goal in the cultivation trials is the evaluation of the productivity and downy mildew resistance of a selected arctic bramble clone, which in preliminary trials has shown disease resistance. The commercial success of the berries also greatly depends on their image. Although the unique aroma of arctic bramble is the key for the marketing, the berries also contain a wide selection of phytochemicals with antioxidant properties, which we have now explored. Seedless arctic bramble puree was extracted with acidified 70% acetone. Acetone was evaporated and the extract was fractionated into tannins and other phenolics in Sephadex LH-20 matrix. Total phenolics were measured from the whole extract and the two fractions. The whole extract contained 4.9 mg/g fresh weight of phenolics, of which 57% were tannins. The preliminary HPLC and HCl-butanol analysis showed that tannins consist mainly of hydrolysable ellagitannins, and not of condensed tannins. The content and composition of the polyphenols, especially ellagitannins and anthocyanins, will be further analysed from the berries to get more detailed information about the phytochemicals of this unique Finnish Rubus species.