Harvest time and drying temperature effect on secondary metabolites in *Rhodiola rosea*

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Abstract

In the present study we evaluated the effect of phenological stage at harvest and drying temperature on the content of secondary metabolites in six year old cultivated clones of Rhodiola rosea. In spite of the differences in the growing season, we found similar development in biomass production and content of secondary metabolites in the two field experiments. During the period with intensive shoot growth, the dry weight of the root decreased until budding/full flowering, followed by an increase towards the last harvest after wilting. The % of dry matter followed the same development. The content of total rosavins in the dry rhizomes was the highest at flowering on both sites and the average content for spring was 24 and 21% higher than in autumn in Finland and Norway (P=0.002), respectively. In Finland the average content of salidroside in spring of the dry rhizome was 68% higher than in autumn. While in Norway there were no difference in salidroside content at the different phenological stages (P=0.097), low variation in the content of cinnamic alcohol at both sites was observed, as well as a tendency to a small increase after flowering. The content of total rosavins was significantly higher at drying temperatures at or below 50°C (P<0.05) compared to higher temperatures. For cinnamic alcohol the significantly highest content was observed at temperatures above 60°C (P<0.05) After one year of storage there was a significant reduction in content of total rosavins and cinnamic alcohol (P<0.05) especially for samples dried at higher temperatures. There was no significant effect of temperature and storage on the content of salidroside (P=0.07 resp. P=0.45).