**Proteome analyses during cold acclimation of *Lolium*-*Festuca* species**

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Winter-hardiness is a complex trait depending on the ability of plants to survive low temperatures, extreme temperature fluctuation, wind desiccation, ice nucleation, and snow moulds infection. Frost tolerance (FT) is thought to be the main component of winter-hardiness and one of the best indicators of plant ability to survive harsh winter conditions. The plant species growing in temperature regions can acquire FT through exposure to low, non-lethal temperatures, a phenomenon known as cold acclimation (CA). Perennial ryegrass (*Lolium perenne* L., *Lp*) is characterized by high nutritive values, rapid establishment rate and persistence. However, its poor ability to perform in harsh winter climates limits its distribution and cultivation. Inversely, meadow fescue (*Festuca pratensis* Huds., *Fp*), a species closely related to *Lp*, comprises lower nutritive values but is more frost tolerant and the most northerly distributed of all the forage grasses within the *Lolium-Festuca* complex. The molecular nature of frost tolerance, expressed differently in *Fp* and *Lp*, is not well recognized and the comprehensive molecular research performed onboth species is required. Herein, we present the results of two proteomic projects, first one focused on *Fp* (finished; Kosmala et al. 2010) and the second one on *Lp* (ongoing).The analyses involved the comparison of leaf protein accumulation profiles during CA between the plants with different levels of FT within each species by the use of two-dimensional electrophoresis and further identification of proteins which were accumulated differentially between the selected plants by the use of mass spectrometry. Application of similar proteomic approach into the analysis of *Festulolium* cultivars is discussed.

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