Antioxidants in Avena genetic resources

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As many chronic diseases are associated with free radical production and inflammatory processes, phenolic compounds with antioxidant and/or anti-inflammatory properties might be part in the health promoting effects found for oats. Of the phenolic compounds present in oats, derivatives of hydroxycinnamic acids and tocopherols and tocotrienols comprise the greatest proportion. Avenanthramides belong to a group of hydroxycinnamic acid derivatives exclusively found in oats. Avenanthramides, as well as tocopherols/tocotrienols, have been shown to possess a wide range of potential health beneficial qualities, including antioxidant, antiproliferative, and anti-inflammatory properties. The content and composition of avenanthramides and tocopherols/tocotrienols varies with cultivars and are also influenced by environmental factors such as e.g. N- rates, location and year.

In the EU funded AVEQ project a broad spectrum of European Avena genetic resources from wild species and land races to traditional and modern cultivars of various provenances are evaluated for traits considered to be important for human consumption. The oat species are grown all over Europe from the Nordic countries to South (Italy) and South Eastern Europe (Bulgaria, Romania) for two years. Avenanthramides and tocopherols/tocotrienols are important traits included in the project. Among the evaluated working collection of 567 accessions, 70 grown in Bulgaria year 2008 have so far been analysed for these traits. Considerable variability was found; in dehulled oats α-tocopherols ranged from 1.5 to 25.4 mg kg⁻¹, α-tocotrienols from 0.8 to 51.6 mg kg⁻¹ and the avenanthramides (2p, 2f and 2c) from 90 to 3870 mg kg⁻¹ (DM). Some accessions were found to have the highest content of more than one component, and represent therefore an interesting material from food qualitative point of view. The results need though to be confirmed by analysing the same accessions from different environments.