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Bioactive compounds extracted from seaweed and application in food systems

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Natural antioxidants derived from marine algae have the potential for improving oxidative stability of lipids in food systems. Brown algae *Fucus vesiculosus* contains a wide range of compounds with potential antioxidant activity, such as pigments, polysaccharides, amino acids and phenolic compounds. *F. vesiculosus* is especially rich in phlorotannins, a major group of polyphenolics. Therefore the *in vitro* antioxidant properties of *F. vesiculosus* extracts have been found to be related to the total phenolic content, but the clarification of how the different phlorotannins contributed to the overall antioxidant activity is lacking. Also, studies on the effectiveness of seaweed extracts in foods are sparse. Therefore more studies in this area are required.

Six different extracts from Icelandic *F. vesiculosus* were studied. The total phenolic content was determined and the *in vitro* antioxidant properties were evaluated. The extracts were also characterized with respect to composition of other bioactive compounds. To evaluate the antioxidant efficacy of the extracts in foods, two storage experiments have been performed. In the first storage experiment two extracts (water and ethyl acetate) were added to 20% fish oil enriched mayonnaise in three different concentrations, 1.0, 1.5 and 2.0 g/kg mayonnaise, respectively. At five time points (day 0, 7, 14, 21, 28) samples were taken and analysed. For the other storage experiment, four extracts were evaluated, an acetone, ethanol and two water extracts; one made of the young part of the seaweed and one of the old part. The extracts were added to 20% fish oil enriched mayonnaise in two different concentrations, 1.5 and 2.0 g/kg mayonnaise, respectively. At seven time points (day 0, 3, 7, 10, 13, 21 and 28) samples were taken and analysed. Lipid oxidation during storage was followed by determination of peroxide value, tocopherol content, fatty acid composition and development of secondary oxidation products. Results from the two storage trials will, along with the characterization of the extracts, be presented.