

nutraberry

Antioxidant activity of isolated ellagitannins from red raspberries and cloudberries

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Abstract

Ellagitannins from red raspberries (*Rubus idaeus*) and cloudberries (*Rubus chamaemorus*) were isolated by using column chromatography and preparative HPLC. The berry phenolic isolates consisted of 80% (cloudberry) and of 60% (raspberry) of ellagitannins, with raspberries also containing anthocyanins. The main ellagitannins of both raspberries and cloudberries were identified by ESI-MS to consist of the dimeric sanguin H-6 and the trimeric lambertianin C. Monomeric ellagitannins such as casuarictin in raspberries and pedunculagin in cloudberries were also found. The antioxidant activity of the berry phenolic isolate, ellagitannin isolate (mixture), ellagitannin main fraction (dimer and trimer), and ellagic acid was studied in bulk and emulsified methyl linoleate, in human low-density lipoprotein in vitro, and the radical scavenging activity was studied in the 2,2-diphenyl-1-picrylhydrazyl (DPPH) test. Cloudberry and red raspberry ellagitannins were highly effective as radical scavengers. Berry ellagitannins also showed significant antioxidant activity toward both oxidation of human LDL and methyl linoleate emulsions. However, only weak or moderate antioxidant activity was exhibited by ellagitannins toward oxidation of bulk oil. Thus, ellagitannins contribute significantly to the antioxidant capacity of cloudberries and red raspberries in lipoprotein and lipid emulsion environments, the latter being more relevant for food applications.

