



Caffeoylisocitric acid – gut microbial degradation of phenolic acids present in amaranth

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In recent years, the interest in amaranth has notably increased due to high amounts of secondary plant metabolites present in these plants with several potential health benefits. It is known, that secondary plant metabolites, but especially phenolic compounds, undergo various metabolic processes in the human body after consumption that influence the bioactivity significantly. As phenolic acids are in general quite hydrophilic, they are not absorbed very well and reach the colon in large quantity where they are metabolized intensively. In contrast to other food sources rich in phenolic compounds such as coffee, where chlorogenic acid is the prominent and already well investigated bioactive phenolic acid, caffeoylisocitric acid (C-IA) is one of the major phenolic acid found in amaranth.

Assuming that C-IA, as another potentially bioactive compound, mainly reaches the colon, *in vitro* fermentations with three different fecal samples were performed in this study for investigating its microbial degradation. Degradation steps of the substrate and metabolite formation were determined using HPLC-ESI-MS/MS. For investigation of a possible impact of C-IA on the microbiota composition, qPCR analyses were carried out.

It was shown that all fecal samples were able to degrade C-IA to lower molecular phenolic acids, but different metabolite profiles were determined when using fecal samples originating from different donors as inocula. However, significant change in the composition of the microbiota was not detected. The intestinal metabolism of C-IA leads to similar products like those already observed for caffeic or chlorogenic acid. Similar to the consumption of food rich in these well-known phenolic acids, potential health promoting effects arising from amaranth consumption should be investigated as well.

Literature

[1] Vollmer et al., Food Research International 2017; 100: 375-384.!