

Title Treating lamb's lettuce with a cold plasma – Influence of atmospheric pressure Ar plasma immanent species on the phenolic profile of *Valerianella locusta*

Author Franziska Grzegorzewski, Jörg Ehlbecke, Oliver Schlüter, Lothar W. Kroh and Sascha Rohn

Citation LWT - Food Science and Technology, Volume 44, Issue 10, December 2011, Pages 2285-2289

Keywords Atmospheric pressure plasma jet; *Valerianella locusta*; Scanning electron microscopy

Abstract

The antimicrobial effectiveness of non-thermal plasma is scientifically accepted. Applications can be found in medicinal sterilisation processes. However, the effects of plasma treatments on plant food with regard to nutritional value are not yet sufficiently investigated. To study the interactions of plasma immanent reactive species with secondary plant metabolites, lamb's lettuce (*Valerianella locusta*) was exposed to an atmospheric pressure plasma jet. Changes in the phenolic profile were compared to experiments with pure substances to determine the influence of the food matrix. Whereas pure flavonoids showed a strong time-dependent decrease, not originating from photo- or thermodesorption processes, the content of diosmetin in lamb's lettuce significantly increased. Regarding phenolic acids, plasma exposure led to a strong reduction in lamb's lettuce, while the concentration of pure monophenols changed little within the same period of time. Treatments with plasma-similar temperatures and UV radiation suggest that due to plasma-reactive species concomitant disintegration of cell membranes and oxidation of released cellular compounds are taking place. Time-dependent changes of the leaf surface morphology due to plasma-induced erosion have been observed by scanning electron microscopy.