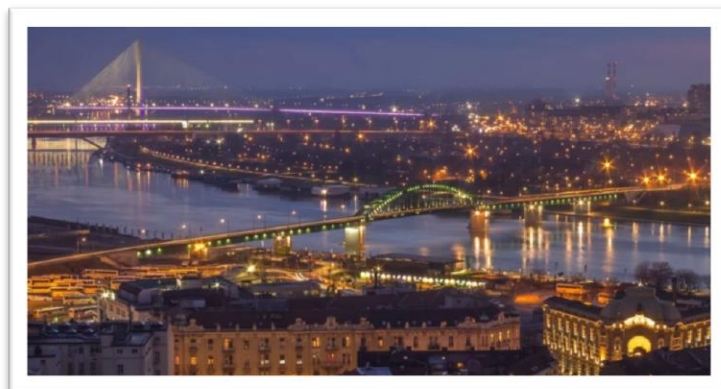




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INFLUENCE OF RAW AND ROASTED HAZELNUT FOOD MATRIX ON IgE BINDING ACTIVITY AFTER APPLICATION OF THE HARMONIZED STATIC DIGESTION PROTOCOL

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Most of the hazelnut proteins are resistant to proteolysis in the gastrointestinal tract, and the survival of their large fragments are essential for their sensitizing capacity. Usually, studies were carried out on purified proteins, paying no attention to the potential impact of the food matrix and thermal treatment on allergenicity. Obtained hazelnut peptides after gastric digestion, especially those with potential IgE binding epitopes, highlight the need for further studies on their IgE reactivity. The aim of this study was to investigate and compare digestion stability and allergenicity of large and small peptides released after pepsin digestion of whole raw and roasted hazelnut kernels under standardized and physiologically relevant *in vitro* conditions, after thermal treatment (roasting as most abundant type of thermal treatment). *In vitro* simulated oral and gastric phase digestion was carried out with ground raw and roasted hazelnut kernels according to INFOGEST protocol. Digested proteins were extracted from the digestion mixture and analysed by 1D and 2D SDS-PAGE, while their IgE binding was probed with allergic patients' sera via ELISA and 2D immunoblot. The most abundant hazelnut allergens within 2DE map were acidic and basic chains of Cor a 9 and Cor a 11. Digestion-resistant peptides of Cor a 11 and Cor a 9 were able to bind patients' IgE. Roasted hazelnut is more prone to gastric digestion than the raw sample, and cause milder IgE response in patients. Gastric phase digestion of raw and roasted hazelnut kernels resulted in partial extraction and digestion of Cor a 11 and Cor a 9 into digestion-resistant peptides with preserved IgE-binding epitopes. These results demonstrate substantial resistance of raw and roasted hazelnut allergens to gastric digestion since they remained mostly intact after 2 h of gastric (pepsin) phase and retained their allergenicity.

Keywords: hazelnut allergens, gastric digestion, food matrix, IgE binding

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