Influence of microwave processing parameters on honey diastase activity

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Summary

It is well known that honey may be processing by means of thermal treatment for two main reasons: first of all to destroy the micro-organisms that may them to contaminate and to modify its tendency to crystallization or delay the appearance of monosaccharide crystals. Such processing can affect quality parameters of honeys. The starch-digesting enzymes of honey are used as an indicators of honey quality because of their heat sensitivity. The aim of this work was to examine the influence of microwave heating on the enzymatic activity of selected honeys. In first part of investigations seven physicochemical parameters of honeydew honeys were determined. Three honeydew honeys from Poland, one from Italy, and one from Turkey were analysed for water content, electrical conductivity, acidity, HMF content, diastase number, sugars and specific rotation. The obtained results were then statistically analysed to characterise the samples in relation to their geographical origin. Principal component analysis (PCA) was performed using the two first components. In second part of investigations honeys were heated using two methods (conventional and microwave) and heating effect on diastase activity was studied. Conventional heating was carried out at temperature of 90°C. Microwave heating was conducted at different power intensity of 1.26 W/g. Inactivation of amylolytic enzymes which occurred during the conventional heating might be a first order reaction, in contrast to the changes occurring during the microwave heating. Changes shows rather complicated mechanism of enzyme inactivation. Such phenomenon may be the result of nonisothermal heating conditions In this research a mechanism of the latter had not been determined.

Key words: microwave hating, enzymes inactivation, honey, diastase activity