

METABOLIC PROFILING OF ROYAL JELLY AS A TOOL FOR THE CHARACTERIZATION OF ROYAL JELLY

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Royal Jelly (RJ) represents a high value food commodity with recognized nutraceutical and pharmacological properties. The chemical composition of RJ has been studied by several researchers, however data available in the literature are highly variable due to the intrinsic variability of this bee product and the various analytical methods applied. In food science, metabolomics have recently risen as a tool for quality and safety of raw materials and final products. In this study a LC-MS/MS metabolite profiling method was developed and validated for the efficient separation and quantification of small polar metabolites in the RJ. The investigated compounds were hydrophilic metabolites such as amino acids, sugars, organic acids, nucleosides, amines and vitamins. Chromatography was optimized to achieve separation of 88 selected metabolites over a period of 21 mins. The method was applied for the analysis of RJ samples with the aim to provide additional information on its metabolite content. A total of 64 metabolites were detected and 41 of them were quantified. Furthermore the results were processed statistically in order to identify the possible effect of beekeeping manipulations in the produced product. Classification of RJ samples according to the type of feeding was carried out using univariate and multivariate statistical analysis, based on the peak area variation of the metabolites. The statistical analysis revealed significant differences in the metabolite profiles of the samples that derived from the feeding experiments suggesting that profiling of hydrophilic content could provide a useful tool for detecting the effect of bee feeding in the composition of RJ.