POMOLIC ACID FROM APPLE POMACE: QUANTITATIVE DETERMINATION BY HETERONUCLEAR TWO-DIMENSIONAL QNMR AND PREPARATIVE ISOLATION

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Pomolic acid (PA) is a pentacyclic triterpenic acid isolated from apples by Brieskorn and Wunderer in 1967 [1]. Its highly relevant biological activity profile came recently into focus and there have been many reports on the content of PA in different plant sources [2]. Quite surprisingly, the general perception of low PA content in plants persists and this information hinders its broader investigation as a compound of pharmaceutical and nutraceutical potential. The main aim of the current work was quantitative determination of pomolic acid in apple pomace by two-dimensional heteronuclear NMR correlation spectroscopy.

The dried and grinded apple pomace was extracted with solvents of moderate polarity, including ethanol, ethylacetate and dimethylcarbonate under conditions of ultrasound assisted extraction. The overall extraction time did not exceed 3 hours. Fractionated extracts were obtained on the separation of acidic and neutral part, followed by selective extraction with solvent series of increasing polarity (petroleum ether, dichloromethane, ethylacetate).

The content of PA in the obtained extracts was determined basing on 2D NMR HSQC experiment according to a recently elaborated protocol [3]. The quantification was based on integration of cross peaks corresponding to selected protons of PA and methyl 2,4-dinitrobenzoate as internal standard. The results showed that the highest content of PA was observed in ethylacetate (13.7%) and dimethylcarbonate (9.5%) extracts. Ethanol extracts displayed lower PA content (4.6%) in extracts and higher material recovery as expressed in percentage PA of dry weight. It was also demonstrated that selective extracts fractionations can provide enriched PA samples on avoiding the laborious chromatographic separations. The broad availability of apple pomace as a by-product of apple juice production ensures an excellent perspective for the preparative isolation of pomolic acid which could be a valuable raw material for the food and pharmaceutical industries.

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References: