

A new methodology for a rapid and high-throughput comparison of molecular profiles and biological activity of phytoextracts

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August 16, 2023

Abstract

To robustly discover and explore phytocompounds, it is necessary to evaluate the interrelationships between diverse variables that affect the composition of the obtained compounds mixtures, such as the plant species, plant tissue and the phytocompounds extraction process. Furthermore, it is relevant to evaluate the biological activity associated to the high diversity of biocompounds mixtures obtained along these processes, including cytotoxicity. The present work evaluates how Fourier Transform Infra-Red (FTIR) spectroscopy can be used to acquire in a simple, rapid, economic, and high-throughput mode the whole molecular fingerprint of aqueous and ethanolic extracts obtained from leaves, seeds and flowers of *Cynara cardunculus*, and ethanolic extracts from *Matricaria chamomilla* flowers. The impact of plant species, plant tissue, and extraction procedure on phytocompounds yield and whole molecular composition was evaluated. FTIR-spectroscopy was also applied to study the effect of each extract on animal cell metabolism, and to compare this activity of different extracts. FTIR-spectra were acquired in automatic mode based on a small sample volume (25 μ L) on 96-wells microplate. The low reduced volumes will further reduce costs and the quantity of biological material needed for this type of analysis while enabling to increase the diversity of conditions screened to achieve. This type of assay can therefore promote the discovery of phytocompounds.

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