

A novel, green process for the valorization of olive leaves

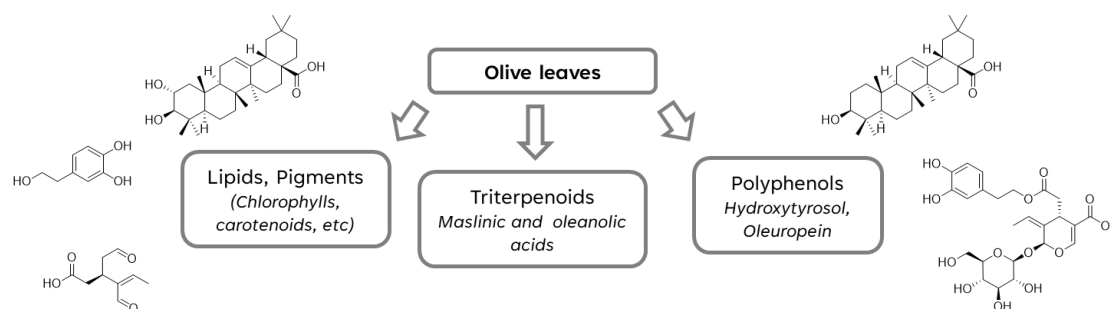
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Utilization of olive cultivation waste products is of considerable industrial interest. Olive leaves are rich in secondary metabolites, the most abundant being the medically relevant polyphenols oleuropein and hydroxytyrosol. Further, the leaves contain large amounts of valuable triterpenes (mainly maslinic and oleanolic acids), which, apart from showing varied biological action, are steadily gaining importance in the production of cosmeceuticals.

Building on our team's year long experience, a novel and highly efficient method of fractionating crude olive leaf extract was designed, which employs sustainable methods. Applying Ultrasound Assisted Extraction (UAE), Supercritical Fluid Extraction (SFE-CO₂) and green alternative solvents (D-Limonene) recycled by Molecular Distillation (MD), resulted in the fractionation of olive extract into three separate fractions. Each fraction was enriched in distinct molecule classes of particular interest from a medicinal standpoint (pigments, triterpenoids, polyphenols), as well as for use in the food- and cosmetics industry. The fractions were analyzed by HPLC and LC-HRMS. Quantification of target constituents was achieved through a newly developed quantification method, based on HPLC combining UV and ELSD detection. The polar fraction was further purified using state-of-the-art automated techniques (MPLC, preparative HPLC, employing exclusively green solvents) to isolate oleuropein, which was used as a synthon for the semisynthesis of novel, olive based bioactive molecules.



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