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Analysis of phenolics and their activities from Prunus Avium branches extracts for cosmetics

AUTHORS

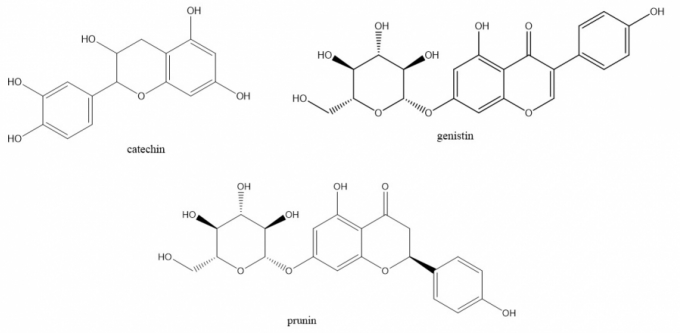
Fanny BRUNISSEN / AGROPARISTECH - URD ABI, 3, RUE DES ROUGES TERRES, POMACLE
Gaelle WILLIG / URD ABI - AGROPARISTECH, 3, RUE DES ROUGES TERRES, POMACLE
Fanny BRUNOIS / URD ABI - AGROPARISTECH, 3, RUE DES ROUGES TERRES, POMACLE
Blandine GODON / URD ABI - AGROPARISTECH, 3, RUE DES ROUGES TERRES, POMACLE
Christian MAGRO / CHESTNUT, 26 RUE BARTHÉLÉMY DE LAFFEMAS, VALENCE
Charles MONTEUX / CHESTNUT, 26 RUE BARTHÉLÉMY DE LAFFEMAS, VALENCE
Cédric PEYROT / URD ABI - AGROPARISTECH, 3, RUE DES ROUGES TERRES, POMACLE
Irina IOANNOU / URD ABI - AGROPARISTECH, 3, RUE DES ROUGES TERRES, POMACLE

PURPOSE OF THE ABSTRACT

In the field of cosmetics and medicine, as the use of natural products is increasingly demanded by consumers, companies are looking for bio-based molecules or plant extracts from biomass. For example, in Japan, the different parts of the cherry tree, important in the local culture, are used in infusion or decoction for their anti-inflammatory effects[1]. The extracts were therefore studied to identify the molecules present in the mixture and to evaluate their bio-activities. Fruits and flowers, very accessible and rich in secondary metabolites of interest and bio-actives[2], have caught the attention of the cosmetic industry. However, since one does not want to destabilize the food sector by producing fruit for cosmetics, other parts of the tree/plant must be used. It turns out that fruit trees are pruned regularly to control their size and promote the appearance of new sprouts. These branches, available in large quantities, are only very little valued at present (left on the ground or valued in methanization or as firewood). They therefore represent an important potential source of extracts rich in secondary metabolites. Studies on the extraction from branches[3], pits or downgraded fruits have been carried out and have revealed the presence of phenolic compounds.

The proposal of our study is to evaluate the potential of local sources of cherry tree branches from the south of the Lyon region.
To this end, extractions were carried out using Accelerated Solvent Extraction (ASE) and the obtained extracts were analyzed by HPLC MS. Experiments were carried out using 34 mL stainless-steel cells, in static mode. To study the impact of the extraction, the operating conditions were varied by changing the temperature (from 25 °C to 150 °C) or the percentage of ethanol (from 30% to 70%). In order to monitor the impact of the extraction, the main phenolic compounds of the extracts were monitored. For this purpose, an LCMS method was developed and optimized, using a C18 column (Zorbax C18 RRHD, Agilent). The mass detector was set in the negative mode of ionization. This allowed us to identify, with the use of databases, and quantify the main phenolic compounds in the extracts. In addition, antioxidant (DPPH test), anti-pigmentation (anti-tyrosinase test) and antibacterial activities were assessed to evaluate the potential of theses extracts as cosmetic ingredients. This study allowed us to determine not only the main phenolic compounds of the branches extracts, but also the operating conditions to implemented to obtain the most active extracts.

FIGURES



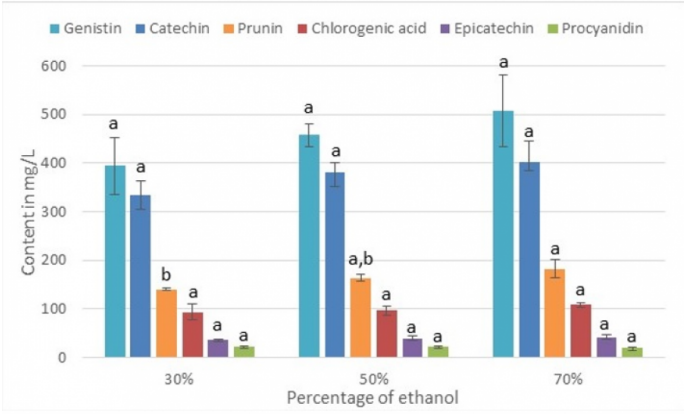


FIGURE 1

Structure of the main phenolic compounds in cherry branch extracts

The 3 main compounds extracted from the cherry tree branches are catechin, genistin and prunin

FIGURE 2

Concentration of the phenolic compounds accordind to the ethanol percentage

The extractions of the cherry branches were performed with different percentage of ethanol to study the impact on the extraction of the phenolic compounds

KEYWORDS

phenolic coumpounds | extraction | identification

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