



HAL
open science

Innovative processes for natural active ingredients extraction and their online functionalization using flow chemistry

Flore Caré, Diakaridia Sangaré, Stéphane Bostyn, Sylvain Routier, Pierre Lafite, Frédéric Buron

► To cite this version:

Flore Caré, Diakaridia Sangaré, Stéphane Bostyn, Sylvain Routier, Pierre Lafite, et al.. Innovative processes for natural active ingredients extraction and their online functionalization using flow chemistry. 31st International Symposium on the Chemistry of Natural Products and 11th International Congress on Biodiversity (ISCNP31 & ICOB11), Oct 2023, Naples, Italy. hal-04670163

HAL Id: hal-04670163

<https://hal.science/hal-04670163v1>

Submitted on 26 Sep 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

INNOVATIVE PROCESSES FOR NATURAL ACTIVE INGREDIENTS EXTRACTION AND THEIR ONLINE FUNCTIONALIZATION USING FLOW CHEMISTRY TECHNOLOGY

Flore Caré¹, Diakaridia Sangaré², Stéphane Bostyn², Sylvain Routier¹, Pierre Lafite¹, Frédéric Buron¹

¹*Institut de Chimie Organique et Analytique (ICOA), Université d'Orléans, UMR CNRS 7311, rue de Chartres, BP 6759, 45067 Orléans, France.*

²*Institut de Combustion, Aérothermique, Réactivité et Environnement (ICARE), 1c avenue de la recherche scientifique, 45071 Orléans Cedex 2, France.*

E-mail: flore.care@univ-orleans.fr

Natural products extracted from biomass are an abundant source of bioactive compounds with high potential for therapeutic or cosmetic applications. Flavonoids compounds, for example, are frequently found in fruits, plants or wood, and offer antioxidant, anti-tumorous, anti-inflammatory or anti-allergic effect^[1]. Yet, flavonoids often suffer from their lack of stability or solubility to be properly valued as active ingredients^[2]. To overcome those limitations and offer environment-friendly industrial applications, flow chemistry has risen as a green technology for innovative process alternatives. Its many advantages provide more efficient and reliable reactions, and facilitate coupling to further functionalization or online analysis^[3].

In this context, our interest has been focused on the development of an integrated process including biomass flow extraction of natural ingredients and their online derivatization in order to enhance their properties.

We implemented the online extraction and functionalization of *Robinia Pseudoacacia* wood, an abundant tree which embodies a valuable biomass source of flavonoids. After optimization, the continuous extraction cell was coupled to various types of structural modification, including mild-condition and selective enzymatic pathways. Innovative new ingredients have been produced from this modular online system, embedded in a responsible and industrializable approach.

This work provides a transferrable methodology of online extraction/structural modification to other biomass and extractible bioactive molecules.

References

1. Kanthasamy *and al.* (2016). *Nutraceuticals*, 447-452.
2. Ghoul *and al.* (2007). *J. Agric. Food Chem.*, **55**, 9496–9502.
3. Kappe *and al.* (2015). *Angew. Chem. Int. Ed.*, **54**, 23, 6688-6728.