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September 15th, 2022 THAILAND

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EDITED BY

SIRILUCK LIENGPRAYOON

SUMAPORN KASEMSUMRAN

PATHAMA CHATAKANONDA

PILANEE VAITHANOMSAT

INVITED SPEAKER -4

BIOGRAPHY

Dr. Erwann DURAND

Qualisud Joint Research Unit (UMR Qualisud),
CIRAD, Montpellier, France
E-mail: Erwann.durand@cirad.fr

Dr. Erwann DURAND from CIRAD (UMR QualiSud) received a multidisciplinary formation in organic and analytical chemistry. His expertise and research interests are focused on the study of microstructures in order to figure out how they may affect the molecular reactivity, e.g. understanding the molecular mechanisms affecting lipid oxidation (and antioxidant) phenomena in complex microstructure is fundamental in food sciences (quality, nutrition, safety, etc.). In this context, he went to implement new antioxidant strategies for preserving oxidation of lipid-based formulation products. In addition, he is doing research activities in the context of green chemistry, with the willingness to design less harmful processes using mild conditions and renewable resources, they mainly encompass the extraction of bioactive molecules (phenolic compounds, lipids, proteins, etc.) from biomass, along with their purification, (bio) transformation and characterization. In this context, he went to investigate for many years the Natural Deep Eutectic Solvents in different research areas (extraction, biocatalysis, formulation, etc.).

He has co-supervised 3 Post-doc, 10 Ph.D. and more than 20 B.Sc. or M.Sc. international students (for 2 to 6 months) either in France, in USA, or in Thailand. The past and on-going grants were funded either by French and international industrial partners, or supported through international programs.

He has authored 55 publications (published or accepted) in peer-reviewed scientific journals. In addition, he has authored 3 book chapters, and gave 11 oral communications at international conferences. He was also associated author in 28 posters/orals communications. Finally, he has an H-index of 17 and, combined together, his articles have been cited almost 1,600 times (source: Scopus).

How the fundamental research may promote a better transformation and use of biomass in food sector

Erwann Durand*

UMR QUALISUD, CIRAD, Montpellier, France
*E-mail: erwann.durand@cirad.fr

ABSTRACT

Background:

The oxidation of formulated products, especially when enriched in lipids, is a complex phenomenon that affects the overall quality of manufactured food, cosmetic and pharmaceutical products. Avoiding lipid oxidation is therefore crucial, especially as manufacturers are incorporating higher amounts of unsaturated lipids into their products for health reasons, thereby making them more sensitive to oxidative degradation. Even though the efficiency of synthetic antioxidants has been recognized, both consumers and manufacturers are looking for more innovative, healthy and quality products while rejecting synthetic additives due to their concern about safety, along with their environmental impact issues.

Hypothesis/Purpose:

To solve this issue, and to propose efficient, long-term economic and environmental solutions, both the fundamental research to better understand the lipid oxidation mechanisms and the plant biomass, which have shown to be rich in compounds and have raised interest for the isolation of novel naturally occurring antioxidants, are essential.

Results and conclusion:

A review of the different works that have been conducted by our team will be presented, with the aim at highlighting how:

- The fundamental research is essential to better understand the chemistry behind the oxidation of formulated products that are enriched in lipids.
- The plant biomass may be the source of novel naturally occurring antioxidants, which could be used to substitute the synthetic ones.
- An approach using the concept of bio mimicry with NaDES could respond to the challenges of sustainable transformation and recovery of biomass and open up great eco-innovative opportunities.

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