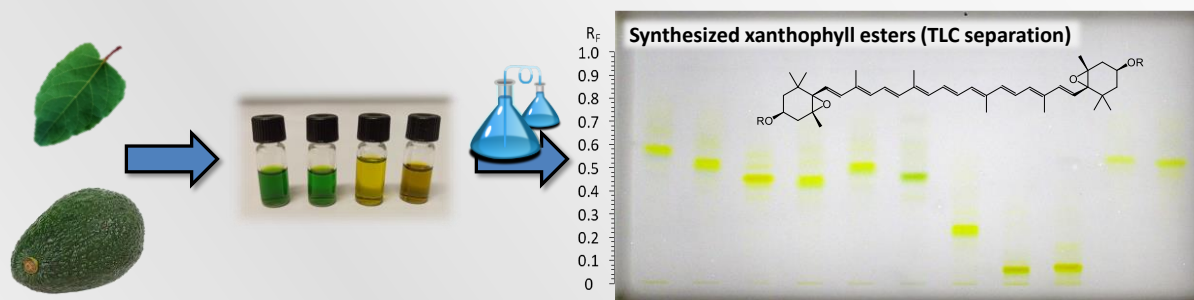


GREEN SYNTHETIC PLATFORM FOR THE PREPARATION OF VARIOUS XANTHOPHYLL ESTERS



Xanthophylls are oxygenated derivatives of carotenoids and, as natural biologically active compounds with known pharmacological properties, they have many positive effects on human health. For some esterified xanthophylls it was shown that they have superior stability and bioavailability compared to their free form. We have developed an energy-efficient and environmentally friendly synthetic platform for the preparation of a variety of xanthophyll esters. This platform can be applied to pigments in pure form (eg., lutein, zeaxanthin, β -cryptoxanthin, capsanthin, violaxanthin), but extracts of natural renewable sources containing these xanthophylls (eg., plant material and food waste) can also be used. The developed approach paves the way for a new line of dietary supplements with increased efficacy and stability, based on esterified xanthophylls.

TYPE OF COOPERATION

R&D cooperation and technology
licensing opportunity

INTELLECTUAL PROPERTY

Know-how

DEVELOPED BY

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MORE INFORMATION ABOUT THE INVENTION

Technology

By using green solvents or no solvent at all, we prepared 55 model xanthophyll esters by reacting free xanthophylls with acetic anhydrides on a laboratory scale under mild reaction conditions. We also developed a simple procedure for their purification which is based either on a liquid-liquid extraction using aqueous media or on solid-phase extraction by employing exclusively green solvents. For selected model systems, this synthetic platform offers high reaction yields (median = 81%) and product purities (median = 97%).

Novelty and advantages

- Energy-efficient approach
- Exclusive use of green reaction solvents which can also be avoided (and waste as well)
- Low amounts of unwanted side products are formed (< 4,5% on average; n = 55)
- Renewable natural materials can be used as sources of xanthophylls
- Product purification follows a green approach and is energy-efficient

Keywords

Food supplement; carotenoids; xanthophylls; esters; acid anhydrides; sustainability; green chemistry; renewable natural resources