Selective extraction of monogalactosyldiacylglycerol from spinach by CO2 supercritical fluid

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Glycolipids are ubiquitous lipids in the membranes of plants, algae, bacteria and animals (1). In plants, galactolipids represent about 77% of fatty acid stocks (2). Upon stress or storage conditions, the glycolipid composition (content, structure) of plants, algae and bacteria can be modified (2–4). The glycolipids of plants and algae, being rich in polyunsaturated fatty acids (1), could be new sources of beneficial omega 3 for the human diet. However, the digestion and the digestive fate of glycolipids are still not well-understood. In addition, glycolipids are amphiphilic molecules with interfacial and biological activities (anticancer, antiviral) (5). To be able to study the properties of these molecules, it is essential to extract and purify fairly substantial quantities.
Supercritical fluid extraction using carbon dioxide (SCF CO2) is an environmentally friendly method, low toxicity and compatible with food processes (6). This method has already been used to extract lipids (neutral and polar) from algae.
We developed an extraction process using SCF CO2 allowing the extraction of high quantity of plant glycolipids and compared it with a conventional extraction process.

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