Oils and fats from southern countries for oleochemistry

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Since its first developments, likely by the invention of soap-like substances almost 5,000 years ago, the oleochemistry has completely flooded our everyday life through biodiesels, detergents, lubricants, polymers, paints, cosmetics or pharmaceutics. The main reasons are (i) the wide structural diversity and reactivity of fatty acids (chain length, number and position of double bonds, presence of lateral functional groups…) allowing the synthesis a multitude of compounds by chemical or chemo-enzymatic routes (esterification/transesterification, epoxidation, hydrogenation, ozonolysis, methathesis, halogenation, amination etc…) and (ii) the growing demand for bio-sourced goods that can compete with existing petroleum-based ones. Today, almost one quarter of the 146 Mt vegetable oil produced worldwide is dedicated to non-food applications including animal feed and oleochemistry (biodiesel, cleansers and fine chemicals). It is also worth mentioning the significant part of animal fats (tallow, lard, poultry fat and fish oil) in the oleochemistry sector, although its production (17Mt) is much more modest than that of vegetable oils. The share of southern countries in the global vegetable oil production rises 60% with a highly contrasted distribution: palm, palm kernel and coconut 41% (almost exclusively East Asia), soybean 12% (almost exclusively South America) and 7% for cotton, sunflower, rapeseed and peanut (mainly India and South America). Excepted biodiesels, the chemical applications of tropical edible oils are obviously related to their fatty acids composition. Therefore, lauric oils (coconut and palm kernel) and palm stearin in a lower extent, will be mostly converted into surface actives ingredients while unsaturated oils rather will be subjected to double bond functionalization or cracking. Alongside of major vegetable oils, there is only a few non-edible tropical oil of importance, regarding their unique fatty acid composition or their production scale, that are exclusively intended to oleochemistry : Castor, Jatropha and Jojoba oils. If new non-food oilseed crops such as *Cuphea* (C8-C14 fatty acids), *Lesquerella* (lesquerolic acid), *Vernonia* (vernolic acid), black mustard (erucic acid) and Tung (eleostearic acid) to name a few, appear to be promising sources of valuable chemical intermediaries for southern countries, the optimization of genetic materials, agronomic practices, and seed harvesting and processing is still needed for their development. Finally, to meet growing demand of vegetable oils in emerging countries, the production increase of major vegetable oils and the development of new ones will face many challenges relating to environmental issues, competition between food and non-food uses and between non-food applications themselves (i.e biofuels vs fine chemicals), bearing in mind costs volatility and speculation on agricultural commodities.