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Flash Communication

GREEN CHEMISTRY & SUSTAINABLE COSMETIC BIOTECHNOLOGY & COSMETIC APPLICATIONS

A. Piccirelli Valagro, France

Extractive Reactive Crushing Process Applied to Oilseeds Biorefinery : An Innovative Route to Extract Pongamol as a Natural Sunscreen Generation

The advent of a sustainable and innovative cosmetic industry requires a lot of pre-requisites : ethical practices, respect of the biodiversity, eco-friendly process, water ressource preservation, development of efficient raw materials to maintain or to improve the technical and biological efficacy of the final products without neglecting the safety and consumer well-being. In this context, eco-extraction which is defined as the green chemistry criteria applied to the extraction of fine phytochemicals, is a key tool to obtain new ingredients and raw materials. If the extraction yield is a unavoidable endpoint, atom economy and energy savings are probably the most important criteria to take into account in the development of a new process. With this objective, the Extractive Reactive Crushing Process (E-RCP technology®) forms a new approach to extract selectively fine molecules directly from oilseeds such as saponifiables molecules (eg. polyphenols, alkaloids, polar terpens, …) and unsaponifiable fractions as well (eg. vitamin E, phytosterols, squalene, sesamine, avocadofurans and avocado hydroxyl-sphingosine, …). This process is based on the in-situ transesterification of lipids carried out directly on the seeds and allows the complete fractioning of the vegetal material (seeds, oleiferous fruits, hulls, pits, …). The resulting products are bioactive phytochemicals, fatty ethyl esters (potential emollients 100% bio-based), glycerin, proteins (as a source of oligopeptides) and carbohydrates (source of polyols and oligomers). The advantages of this technology are the whole valorization of the plant material according to the sustainable concept of biorefinery, the perfect control of the supply chain including traceability, risk management regarding possible contaminants (pesticides, PAHs, adulterants, GMO, …) and the possibility to produce identity preserved raw materials (eg. avocado glycerin).

E-RCP has been successfully applied to the Karanja seed (Pongamia glabra), a wild tree issued from the Indian biodiversity, rich in pongamol and karanjin. Pongamol (4-methoxy-5-benzofuranyl)-3-phenyl-1,3-propanedione) is a natural UV-absorber. Formulated with green polymers (Viscoplast® polyesters) and exclusive bio-based paraffins (Vegelight® coco alkanes), we obtain a new suncare generation with high SPF from 30 to 50. These natural UV filters which are available under oil and gel forms, are silicone and preservative free, without use of water