



Nature diversity to serve beauty diversity.

LEROUX Richard; SEDERMA

MONDON P., RINGENBACH C., BARROIS R., and HISHDA; SEDERMA

Introduction of research

Diversity has become a huge trend in the beauty industry. A radical shift is occurring, beauty ideals are evolving towards an inclusive approach from wider spectrum of ethnicities, sizes, ages and genders. It is essential for all ethnic origins to be addressed with a clear and specific offer. Then, beauty brands attempt to truly match skin tone diversity by multiplying their references. But diversity is also present in nature and offers solution to serve diversity in beauty.

People with olive complexions present green skin undertones, often associated with type III to V skin phototypes. Olive complexions have in common very specific beauty concerns related to their hyper-inflammatory phenotype. Due to exposome stresses (sun exposures, pollution, smoking, lifestyle etc), skin is more prone to damages that induce micro-inflammation phenomena thus modifying the skin appearance. Complexion loses its natural radiance and becomes uneven and dull. Moreover, it tends to be greenish because of both inflammation and oxidation that contribute to haemoglobin and biliverdin accumulation at the skin surface. People with olive complexions also produce more melanin at the baseline and overreact to most pigmenting stimuli.

Our objective is to design a specific solution that reduces inflammatory hyperpigmentation, dullness and redness while reinforcing the skin barrier homeostasis and demonstrate that our inclusive solution made of whole native phytochemicals is better than the isolated molecule obtained in the extract.

Body

Initially developed to study fundamental metabolisms of plants, plant cell culture (PCC) has become a well-established method to produce natural substances for food, cosmetic and pharmaceutical industries. This method of production replaces conventional methods of molecule extraction from plants or from their chemical synthesis. This new culture method allows to obtain large quantities of novel molecules while limiting the impacts on the plant (geopolitical, climatic, hydrological, crop area, cultural practices) as well as on extremely complex or impossible syntheses.

Buddleja davidii is a shrub with frail but abundant branches. This plant was traditionally used in the treatment of inflammatory intestinal conditions, wound healing and to reduce skin fragility. Plant cell culture of *Buddleja davidii* (BD-PCC) was processed to obtain an extract rich in protective phytochemicals: verbascoside that demonstrated interesting properties such as moderating the production of proinflammatory mediators and protecting eye tissues and nerve cells in the past (Speranza et al., 2009; Esposito et al., 2010a and b; Vertuani et al., 2011; Mosca et al., 2014). Ultra-soft process allows to preserve 65 % of whole native cells enabling BD-PCC to potentiate verbascoside performance up to 1.8 times greater than isolated verbascoside during preliminary trials (DPPH, singlet oxygen, UVA-induced



anti lipoperoxidation (results not showed). BD-PCC-induced modulations of several biological markers on human melanocytes (HM), keratinocytes (HK) and fibroblasts (HF) were quantified by different technologies (qRT-PCR, ELISA-type kits and immunohistology).

HM melanin synthesis and tyrosinase activity were respectively significantly reduced by 42 and 47% with 535ppm of BD-PCC. Hyaluronic acid released by HK increased by 240% such as involucrin +60%, collagen VII +175% and Laminin +178% versus control. AGE (advanced glycation end-products) formation was reduced by 94% versus control. HK mediators of inflammation PGE2, IL-8, IL-1 α ...) were reduced so was reactive oxygen species production both on HM and HK, -92% and -85% respectively.

A multiparametric clinical evaluation performed on 26 volunteers with olive skin, shown the BD-PCC-induced improvements on several skin parameters. A 1-month application of a cream containing 535ppm of BD-PCC significantly improved dark area lightening vs placebo by 8.5%, so was skin texture by 6%.

Conclusion

Our research and expertise in plant cell culture allowed us to identify a specific process offering an inclusive extract with more and better activities than isolated molecule. Our evaluations demonstrate BD-PCC controls melanin production but also AGEs, ROS and pro-inflammatory mediators while improving the skin barrier quality. A multiparametric clinical evaluation demonstrated an improvement of the skin aspect and texture observed and also perceived by volunteers. Diversity in our extract serve beauty diversity by targeting the specific needs of olive complexions found in different parts of the world (LATAM to South East Asia).

References

-
- Speranza L., Franceshelli S., Pesce M., Menghini L. Patruno A., Vinciguerra I., Da Lutiis M.A., Felaco M., Felaco P. and Grilli A., *J. Biol. Regul. Homeost. Agents*, **23**, 189-195, (2009).
- Esposito E., Mazzon E., Paterniti I., Dal Toso R., Pressi G., Caminiti R. and Cuzzocrea S., *PPAR Res.*, Article ID 917312, 10 pages (2010)
- Esposito E., Dal Toso R., Pressi G., Bramanti P., Meli R. and Cuzzocrea S., *Naunyn. Schmiedebergs Arch. Pharmacol.*, **381**, 93-105, (2010).
- Vertuani S., Beghelli E., Scalambra E., Malisardi G., Copetti S., Dal Toso R., Baldisserotto A. and Manfredini S., *Molecules*, **16**, 7068-7080 (2011).
- Mosca M., Ambrosone L., Semeraro F, Casamassima D, Vizzarri F, Costagliola C., *Int. J. Food Sci. Nutr.* **65**, 235-240 (2014).

About the speaker



et, Suite 1620, New York, NY 10005 | P: (212) 668-1500 | E: scc@scconline.org | W: www.scconline.org



Dr Richard Leroux is the Scientific and Technology Manager for SEDERMA, in charge of the promotion of SEDERMA's scientific and technology capabilities and for open innovation projects with the commercial partners. Dr Leroux has a PhD in organic chemistry from University of Rouen (France) on synthesis of biologically active peptides.

During the last 25 years, Dr Leroux has been part of the R&D leading team to develop the new generation of active ingredients capitalizing on his expertise in peptide chemistry and his experience to design biomimetic peptides as well as molecular structures inspired by nature. Nowadays, Dr Leroux is also involved in the development of botanical actives, biotechnology and plant cell culture.