Bringing context to the energy transition

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The energy transition is one of humanity's grand challenges.
Although everybody agrees the transition to an economy driven by renewable resources will eventually be reality, most of us find it difficult to give this notion context in our daily lives.
What can we do as individuals, companies, policy makers and governments to not only accelerate this transition, but even benefit from it? And moreover, what is the bigger picture? What is the energy transition, really? How big is this grand challenge? And what models, structures and developments can we adopt to become part of the solution?

The Nagoya Protocol : impact on the cosmetic Industry R&D activities

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FEBEA is the French Trade Association of Beauty and Wellness companies. It represents 300 manufacturers of Fragrance, Cosmetics, Toiletry, and Capillary products, accounting for more than 97% of the turnover of the sector.

INTERNATIONAL CONTEXT:
In 1992, 168 countries ratified the Convention on Biological Diversity (referred to throughout this document as the CBD) during the Earth summit organised by the United Nations at Rio de Janeiro.
The CBD is the first strong international commitment to recognise the necessity to preserve biodiversity and to promote the sustainable use of its components while sharing on a fairly manner the benefits from its utilisation.
Specifically the CBD is aiming at the following three objectives:
1. The conservation of biological diversity
2. The sustainable use (use = R&D) of its components
3. The fair and equitable sharing of the benefits arising out of the use of genetic resources and traditional knowledge

From this adoption, the countries then started to negotiate at an international level on the best way to implement the CBD. This process gave birth to the Nagoya protocol in 2010.
The Nagoya protocol has already been signed by 95 parties including the European Union and France as of today (February 3rd2017) and has entered into force on October 12th, 2014.

IMPACT OF ACCESS AND BENEFIT SHARING REGULATION FOR THE COSMETIC INDUSTRY AND THE R&D PROCESS:
Concretely when supplying a genetic resource, the manufacturer or the ingredient supplier if it conducts R&D will have to face new obligations:

- Check if the country of origin has a specific regulation and the terms of this regulation,
- Ask for access authorization to the competent Authority and negotiate a benefit sharing contract,
- Organize an internal procedure to make sure all the department are aware and comply with the law: R&D, Purchase department, marketing are concerned.
- Collect the necessary documents to be able to prove the compliance,
- Support additional cost.

CONCLUSION:
We -cosmetics industry- are marketing product for personal care, pleasure, self-esteem. Because of the social and intimate role of cosmetic product, our members strongly believe that their responsibility as Cosmetic Industry is to promote a sustainable use of biodiversity and to promote a fair share of its benefits.

Although, the Industry strongly supports the Nagoya Protocol principles, their implementation create many issues and risks: additional constraints in the R&D process; administrative burden, additional costs which may be diverted from their primary objective -the Biodiversity preservation- in heavy administrative structure.
We need to continue our dialogue with National authorities and focal points: the issue at stake is our ability to continue innovation in both economic and sustainable way for biodiversity preservation and local community reward.

From biodiversity to chemodiversity: novel plant produced compounds with cosmetic interest; the case of AgroCos

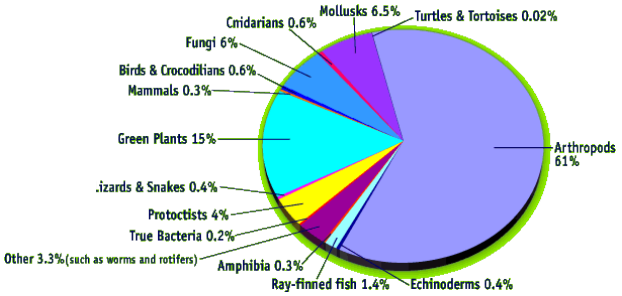
Alexio-Leandros Skaltsounis, Professor Pharmacy University, Greece

Nature has developed an enormous diversity during billion of years of evolution. It is estimated that in our planet exist around 30 million insects, 1.5 million algae, 1.5 million fungi, 1 million animals, 400.000 plant species etc (Picture 1). Green plants represent almost the 15% of the leaving organisms of our planet. It is historically proven that the green plants were facilitating the mankind significantly and were assisting its survival and progress. Despite their great importance only a small proportion, approximately 10% of the classified ones have been investigated and chemically characterized.

All of these species coexist in ecosystems and interact with each other in several ways. All the organisms share a similar biochemistry necessary for a living cell. They produce a wide variety of the so-called "secondary metabolites" or "small molecules".
Secondary metabolites are organic compounds characterized by small molecular weight that are not directly involved in the normal growth, development or reproduction of organisms. Unlike primary metabolites (peptides, proteins, lipids, carbohydrates), absence of secondary metabolities results not in immediate death, but in long-term impairment of the organism's survivability/fecundity or aesthetics, or perhaps in no significant change at all. Secondary metabolites are often restricted to a narrow set of species within a phylogenetic group. Secondary metabolites are usually candidates for drugs, cosmetics or other technological developments directly, or as an inspiration for unnatural products. Some of the most important groups of small compounds are phenolic compounds (simple phenolic acids and phenols, flavonoids, isoflavonoids, tannins etc.), terpenoids (mon-, di- and triterpenes, sterols, saponins etc), alkaloids (quinolines, quinolizidines, tropanes, isoquinolines, indoles etc), iridoids, coumarines, sulfur compounds etc[1].

The aim of the AgroCos project was to discover and carry to the stage of development candidates, plant derived small molecules with potential as new cosmetic agents. These compounds derived from plants originating from major biodiversity hotspots in Europe, Africa, Latin America, and the Asia-Pacific regions. The starting point of the project was a diversity-oriented natural product library of 500 compounds, from which promising scaffolds were identified through screening. Chemotaxonomy and chemodiversity oriented collection of plant material, the generation of a library of 3600 extracts, and a state-of-the-art technology platform for miniaturized natural product discovery generated focused sub-libraries around these privileged scaffolds. Further evaluation of these sub-libraries led to the development of novel products in cosmetics with new or improved properties over existing active ingredients.

[1] Walton, NJ & Brown DE, 1999, *Chemicals from Plants, Perspectives on Plant Secondary Products*, London.



Picture 1: Global species diversity and percentage

Multifonctional sustainable zeta fractions from living plants

Michael Koganov, Vice President BioMaterials, Ashland, USA

Often, osmotic shock, oxidative stress and de-compartmentalization in dried plant cells negatively impact efficacy, bioavailability, functional properties, safety and reproducibility of conventional botanical extracts. This prompted the development of a sustainable solvent-free Zeta Fraction Technology (ZFT), which is based on scientific principles discovered by Van't-Hoff and Debye, and on Derjaguin-Laundau-Verwey-Overbeek (DLVO) theory. Progress in life sciences and in instrumentation for broadband dielectric spectrometry has contributed to the development of ZFT.

This technology includes: collection of living plants with maximum metabolic activity; separation of relatively stable intracellular colloidal dispersion (ICD) from cell walls; treatment of ICD to engage particular components of the dispersed phase and continuous phase in specific interactions by changing the balance between repulsive and attractive forces; and separation of ICD to different Zeta Fractions. Plant examples including Sacred Lotus (Nelumbo nucifera), Tea Plant (Camellia sinensis), Feverfew (Chrysanthemum parthenium), Ficus (Ficus benghalensis) and Sage (Salvia officinalis) demonstrate that ZFT allows targeting multiple pathways with a single ingredient, improving safety by removing undesirable components and chemicals of concern, all while resulting in minimal environmental impact and waste. ZFT utilizes the underexplored potential of living plants and may be used in combination with existing extraction technologies to achieve effective volume reduction and minimize environmental impact.

Outlook for green labels: natural, organic and ethica

Amarjit Sahota, President of Organic Monitor, United Kingdom

This seminar will give details on the growing number of green labels for cosmetics & personal care products. An update will be given on the most popular green labels: natural and organic, as well as details of emerging schemes, such as Fairtrade, Non-GMO, etc. The latest market trends and developments will be given for the global market for natural & organic personal care products, including future projections.

What do you need to consider when formulating for sustainable hair care

Emmanuel Everaert, Research Fellow, Care Specialties R&D, Ashland, The Netherlands

Sustainability is an ever growing trend and continues to expand into new and different areas such as antipollution and demands from consumer companies on their suppliers is increasing and causing numerous challenges on how to meet these. The targets, the technical definitions and ways to express the different needs vary from one customer to another. In this presentation we are proposing pragmatic and concrete approaches into "what to consider" when formulating for sustainable Hair Care:

1. Choice of Raw material
2. Impact of Raw material in the formulation – referred as the total formulation impact
3. Impact at the instance of use.

The impact on sustainability could be optimized or further improved when considering all 3 aspects in one formulation. The choice of raw material will take into account more of it's origin (natural plant, plant extract, semi-synthetic, synthetic), it's degree of modification and it's impact on the environment. It is important to develop technologies that can be more effective at delivering the key product benefits such as bioavailability, higher deposition efficiency, product texture and in-use sensorial properties. More effective Ashland technologies could allow the reduction of the amount of other ingredients with a net positive impact on sustainability and even lower cost. The energy utilized (or carbon footprint) at the instance of use for hair care products such as shampoo and conditioner can easily overwhelm the product itself, hence why developing products which require less warm water to rinse and less drying time will bring potential into the total sustainability and environmental impact

In this presentation we will show concrete examples into why Ashland can, offer solutions to formulators. For instance how in a shampoo can reduce by up to 50% the current use level of a popular cationic polymers, Polyquaternium PQ10 whilst still enhancing performance. Then in conditioners, how you can reduce the conditioner structural ingredients level significantly and provide new added benefits. Formulation examples will be further validated by in-vitro methods such as, rheology, benefit agent deposition, conditioning performance (combing and friction) and microscopy.

A holistic approach to personal care aerosols in enhancing the sustainability profile while achieving product performance

David Streuli, Principal Scientist, Care Specialties R&D, Ashland, USA

A holistic approach to personal care aerosols in enhancing the sustainability profile while achieving product performance

There are several strategies currently employed to reduce the environmental impact within personal care aerosol systems, regulatory based and internally driven. Incorporating propellants with reduced photochemical reactivity, increasing the non-volatile components within formulations, or modifying the overall format to reduce the atmospheric contribution can help to minimize product impact. Alternative packaging and pressurants can offer improved environmental profiles, though often fall short in consumer delivery expectations.
Combining all or some of these parameters with a more targeted substrate delivery can reduce product waste and improve performance, creating a balance of delivery aesthetics and a more sustainable product.