



Bioscience at a Crossroads

Access and Benefit Sharing in a Time of
Scientific, Technological and Industry Change:

The Cosmetics Sector



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Front cover photographs:

Left: Shea butter processing plant, washing the shea butter, Burkina Faso

Centre: Ylang-ylang

Right: Shea butter and nuts

This page: Dahlia perfume essence (Rachel Sarah - Not sure we need this?)

Back cover:

Left: Rooibos tea leaves

Centre: Sweet almonds

Right: Aloe vera, Madagascar (if using pic from endnotes)

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The focus of this brief is on the use of genetic resources and associated traditional knowledge in the cosmetics industry, although conclusions and recommendations have broad applicability to other subsectors. Note that separate policy briefs review access and benefit-sharing issues pertaining to the pharmaceuticals, agriculture, botanicals, industrial biotechnology and food and beverage sectors. The reader is also referred to the overview brief in this series: Laird, S. and Wynberg, R. 2012. Bioscience at a crossroads: Implementing the Nagoya Protocol on access and benefit sharing in a time of scientific, technological and industry change. Secretariat of the Convention on Biological Diversity, Montreal. Policy briefs can be found at: <https://www.cbd.int/abs/policy-brief/default.shtml>



INTRODUCTION

The cosmetics and personal care sector is in many ways emblematic of some of the challenges and opportunities which access and benefit sharing (ABS) brings. Although the sector relies to a large extent on “tried and tested” natural ingredients, traditional knowledge and new species are also used, and the “story” of different ingredients is a critical part of product branding and marketing. Because of this, the sector is highly sensitive to allegations of missappropriation¹, which can turn manufacturers away from certain ingredients and consumers away from products. Unlike pharmaceuticals, which few patients are likely to reject, cosmetics, perfumes, and personal care products are seen as luxury items that are rarely indispensable and which represent a conscious choice by consumers.

Cosmetics are defined as “any substance or mixture intended to be placed in contact with the various external parts of the human body or with the teeth and the mucous membranes of the oral cavity with a view to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours.”² They are used for a variety of different applications ranging from hair care, perfumes and fragrances through to beauty and personal care, nutricosmetics, or beauty supplements, as well as the rapidly developing category of cosmeceuticals, which typically include bioactive compounds.

The use of natural ingredients in the cosmetics industry has grown significantly over the past fifteen years, driven by growing consumer interest in health and well-being, as well as organic and fair trade products. This has led to increased demand for botanical ingredients. At the same time, this sector has experienced a significant turnaround with regard to ABS awareness and commitment to ethical sourcing practices. Realizing this new-found awareness



Flaxseed oil is used in creams to moisturize the skin

in practice, however, is not always straightforward or simple.

Many cosmetic and personal care products contain multiple ingredients from natural sources, most of which are well known and do not contain active compounds. Some companies, however, are involved in as research-intensive activities to identify interesting biochemical properties.

Advances in science and technology allow companies to more effectively screen and identify active natural compounds, and many seek intellectual property protection for these, the delivery systems employed, and associated innovations. However, there is enormous variation within this sector in terms of the level of science and technology employed by companies, investments in research and development (R&D), and approaches to patenting.

This brief provides an overview of the industry, summarizes key market and R&D trends, and analyses the implications of these trends for governments and companies who are involved in ABS activities and in the implementation of the Nagoya Protocol.

INDUSTRY OVERVIEW AND MARKET TRENDS

A PROFILE OF THE INDUSTRY

Use of natural ingredients in cosmetics

Cosmetics and personal care companies have a long and significant interest in natural products, and what was once a fringe part of the industry is now mainstream and still growing (Figure 1). Nonetheless, natural ingredients still represent only about 6% of the overall market. The trend towards use of natural ingredients is not confined to the more pure “natural cosmetics” component of the market, but is now also widespread in conventional cosmetics, including those that are “nature-inspired”. Such products incorporate a wide range of plant-based materials including oils, fats and waxes, essential oils and oleoresins, plant extracts and colourants (Table 1).

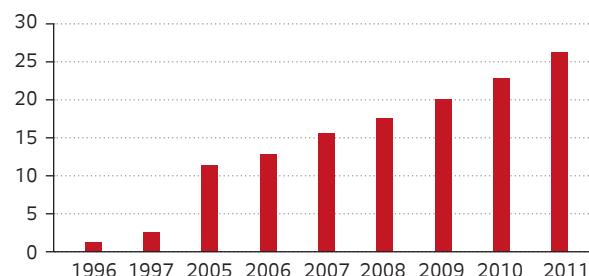


FIGURE 1. Annual Revenues in the Global Natural Personal Care Market 1996 - 2011³

The amount of natural ingredients used in products ranges from extremely small, for a company wishing to infuse a feeling of “naturalness” or luxury in a product, to substantial quantities for active ingredients that have an

effect. Nearly 75% of these so-called “natural” products, however, have only a small amount of natural ingredients incorporated, largely for marketing purposes.⁴ Products referred to as “nature-inspired” may contain virtually no botanical ingredients whatsoever. Many cosmetics also contain synthetic ingredients like silicones, polysorbates, chemical derivatives, and ethoxylates, alongside natural ingredients. Products that are certified as “natural cosmetics” by accredited schemes are prohibited from using certain ingredients, including many synthetics, but these are in the minority.

GLOBAL MARKETS

The spectrum of companies using natural ingredients forms part of a much larger personal care industry, estimated to be worth US\$426 billion.⁶ Global sales in 2011 for the “natural cosmetics” segment comprised about US\$26.3 billion, representing strong growth in this sector over the past fifteen years, up from just US\$1.4 billion in 1996 (Figure 1). This has been due in part to increased consumer demand for healthier, more sustainable products; greater affordability of natural products; rising disposable incomes in Asian and Brazilian markets; and increased product supply of “blockbuster” categories.⁷ At the same time, economic difficulties in the United States and Europe have slowed growth in these regions.⁸

There has been a significant growth of personal care products in Asia in recent years, and the continent now leads with a global market share of 37% (Figure 2). The United States and Europe account for almost 40% of the global natural cosmetics market. Within Europe, Germany and France represent the strongest markets for natural cosmetics but Asia, Brazil and Eastern/Central Europe are considered to hold the most opportunity for high growth over the next few years.⁹

The industry comprises a number of different product classes, with sales for skincare – and anti-aging products in particular – being the largest by far (Figure 3).¹⁰

"In the cosmetics industry, 99% of natural ingredient use is for marketing. We are selling an experience, and this is enhanced by reading on a label that something in the product is from Africa or the Amazon... so the ingredient may not have a biological activity, but it has activity in the sense of enhancing your experience. If cosmetics that you apply every day for long periods of time had real activity, it wouldn't be safe. Everyone does this to a certain extent – what we call "fairy dust": such small quantities that they don't really do anything, but they do enhance the experience of using a product."

– Manager of a small ingredient company.

TABLE 1. Examples of Plant-derived Ingredients Commonly used in Cosmetic Products.⁵

INGREDIENT TYPE	INGREDIENT	SOURCE	FUNCTION
Oils	Castor oil	<i>Ricinus communis</i>	Moisturizers, emollients
	Jojoba oil	<i>Simmondsia chinensis</i>	
	Almond oil	<i>Prunus dulcis</i>	
	Sesame oil	<i>Sesamum indicum</i>	
	Avocado oil	<i>Persea americana</i>	
	Apricot kernel oil	<i>Prunus armeniaca</i>	
	Rapeseed oil	<i>Brassica napus</i>	
	Linseed oil	<i>Linum usitatissimum</i>	
	Sunflower seed oil	<i>Helianthus annuus</i>	
	Palm oil	<i>Elaeis guineensis</i>	
Fats and waxes	Coconut oil	<i>Cocos nucifera</i>	
	Cocoa butter	<i>Theobroma cacao</i>	
	Carnauba wax	<i>Copernicia prunifera</i>	
Gums	Candelilla wax	<i>Euphorbia spp.</i>	Stabilizers, adhesive agents, jelly lubricants, suspending agents, thickeners, binders
	Gum arabic	<i>Acacia spp.</i>	
	Gum tragacanth	<i>Astragalus spp.</i>	
	Guar gum	<i>Cyamopsis spp.</i>	
Essential oils	Locust bean gum	<i>Ceratonia siliqua</i>	Fragrances
	Patchouli oil	<i>Pogostemon cablin</i>	
	Citronella oil	<i>Cymbopogon winterianus</i>	
	Sandalwood oil	<i>Santalum album</i>	
	Bergamot oil	<i>Citrus aurantium</i>	
	Rosemary oil	<i>Rosmarinus officinalis</i>	
	Rose oil	<i>Rosa damascena</i>	
	Mint oil	<i>Mentha piperita</i>	
	Jasmine oil	<i>Jasminum officinale</i>	
Extracts and saps	Vetiver oil	<i>Chrysopogon zizanioides</i>	Moisturizers, emollients
	Aloe sap	<i>Aloe vera</i>	
	Açaí fruit extract	<i>Euterpe oleracea</i>	
	Baobab fruit extract	<i>Adansonia spp.</i>	
Colourants	Guarana extract	<i>Paullinia cupana</i>	Colouring
	Indigo extract	<i>Indigofera spp.</i>	
	Curcuma extract	<i>Curcuma spp.</i>	
	Henna extract	<i>Lawsonia inermis</i>	
	Marigold extract	<i>Tagetes spp.</i>	

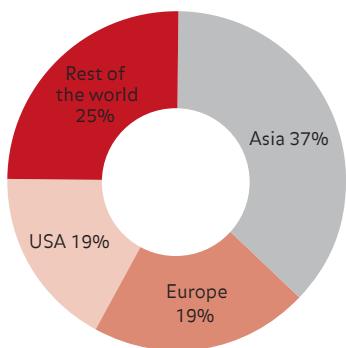


FIGURE 2. Sales of Natural Personal Care Products by Region, 2011¹¹

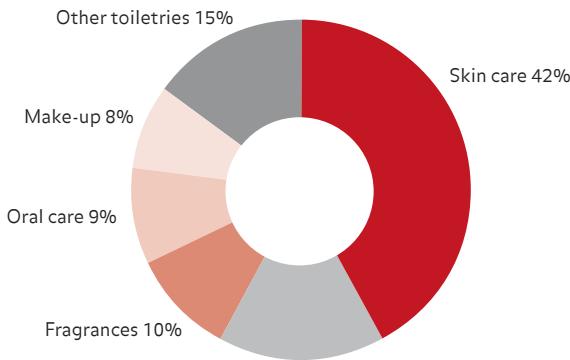


FIGURE 3. Global Manufacturers' Sales of Natural Personal Care Products by Product Class, 2011¹²

TABLE 2. Top 10 Marketers of Cosmetics Products using Natural Ingredients.¹⁷

Top 10 Companies	'Natural' Brands Offered	Headquarters	Total Sales 2012 – US\$ billion
1 Johnson & Johnson	Aveeno	USA	67.2*
2 L'Oréal	The Body Shop, Kiehls	France	29.3
3 Colgate-Palmolive	Tom's of Maine	USA	17.1
4 Estée Lauder	Aveda, Origins	USA	9.7
5 Shiseido	Bare Escentuals	Japan	8.3
6 The Clorox Company	Burt's Bees	USA	5.5
7 Yves Rocher	Yves Rocher	France	±3
8 The Hain Celestial Group	Jason Natural Products, Avalon, Alba, Zia Naturals	USA	1.4
9 L'Occitane	L'Occitane	Luxembourg	1.2
10 Harvest Partners	Arbonne, Nature's Gate	USA	1.1

* Note that this figure for Johnson & Johnson includes non-cosmetic products

TOP COMPANIES

Ten companies represented nearly 50% of total market sales of personal care products using natural ingredients in 2010.¹³ However, the market is considered to be highly fragmented with only three brands having a share of 3% or more.¹⁴ Table 2 summarizes the top ten marketers of cosmetics products using natural ingredients, and the brands offered. While large international companies

retain most of the market share, a significant number of small and medium enterprises (SMEs) also exist. In Europe, for example, two-thirds of the 4,000 cosmetics companies are SMEs.¹⁵ Of interest is that companies are increasingly paying attention to biodiversity in their reporting, with 80% of the twenty largest beauty companies mentioning biodiversity in their corporate sustainability reports, and 75% indicating that they review how their supply chains impact biodiversity.¹⁶

ETHICAL AND SUSTAINABLE SOURCING

The supply chain for natural ingredients

Trade in raw materials for the cosmetics industry takes place in a similar fashion to that for the botanicals and food sectors, and uses many of the same intermediaries. Plant species are often used in more than one industry, meaning that the same material may be used as a botanical, cosmetic or food product. Several different approaches and chains may be used to obtain material. One common model may see local dealers sourcing plants from local growers or collectors, usually purchasing it already dried. Material may pass through a number of local traders or cooperatives before it is exported. Plant material, typically hundreds of species, will then usually be stored in the large warehouses of international trading companies, the most significant of these occurring in Hong Kong, Tokyo, New York and Hamburg.¹⁸ These larger companies play a central role in quality control and pricing, acting as clearing-houses for the wider plant trade.

The approach described continues to be the *modus operandi* for most companies in this industry, which seek low risk and cheap raw material. Another emerging model for many companies is the outsourcing of the extraction and processing to China, India or other low-cost labour centres that have active processing facilities. Some of the larger companies are also increasingly involved in controlling the supply chain for key ingredients, giving them a greater say in the pricing of raw material and assuring its quality and availability. This includes relationships with suppliers in developing countries, as well as outgrowing schemes in Eastern Europe and other regions.

Many of these trends are driven by markets, economics and expediency but in some cases ethically orientated cosmetics companies seek to enable better social and environmental outcomes by shortening the supply chain, investing in closer relationships with suppliers, and helping add more value and build local businesses and capacity in source countries. Typically, these practices are limited to a few ingredients



Top: The healing properties of *Centella asiatica* have been known for centuries, and it is commonly used in skin lotions

Bottom: So-called perfume plants are widely used by indigenous peoples in Namibia. Photo: Rachel Wynberg

"There is a real range in suppliers, and the information on sourcing raw materials they provide is really varied. Many have not dotted all the i's and crossed the t's in terms of their legal obligations. A lot of chemical companies are supplying naturally-derived ingredients but do not think about sustainability or about the CBD, never mind the needs of harvesters or communities where the material came from. But others can track material back to the lot number and say exactly under what circumstances it was produced, and can provide documentation to this effect. A few might even have close relationships with sources. There is a real range. But as a big company, purchasing material from intermediaries, we can really use the bully pulpit and try to get them to pay attention to these issues."

— Researcher at a large personal care and cosmetics company.

rather than the entire range. This is especially the case for niche ingredients that require smaller volumes of material.

Although approaches vary, it is common for intermediary firms to conduct R&D on new ingredients, either upon the request of a company looking for an ingredient with certain features, or as a result of the intermediary firm selling a new ingredient and concept to brand owners or marketing companies. Companies such as Givaudan, Firmenich, Mane and Euromed will typically source raw materials but may also be involved in other aspects such as R&D and marketing. Because of the diversity of ingredients used, and the multiple supply chains involved, brand owners and retailers are often far removed from the environmental and social origins of the ingredients they purchase. Increasingly, therefore, there is a trend towards moving the burden of compliance with environmental and social standards towards suppliers that source raw materials.¹⁹

ABS approaches, ethics and sustainability

Increasing consumer demand for new and established natural products means that sustainability questions have become central to the cosmetics sector. Consumers want to know that they are purchasing a product that is ecologically sustainable, and companies are under increasing pressure to demonstrate that they are making a positive environmental and social impact. Almost all of the high-volume trade species are supplied from cultivated plantations, assuring a steady and reliable supply chain, easier quality control and reduced pricing, as well as allowing

companies to monitor the environmental and social conditions of supply. Nonetheless, wild collection continues when there is specific buyer demand related to higher active-ingredient content of wild collected species, if wild-collection prices are low, or if species are new to the market or used in small quantities.²⁰

The marketing value of sustainably and ethically sourced raw materials is significant in some regions. Companies that have historically extracted cosmetic oils in Europe, for example, now seek local groups in the source country to do this extraction, and build this into the product's marketing story, in order to capitalize on consumer interest in ethical raw materials. "It costs more", observed one industry representative, "but consumers are prepared to pay this because of the social value."²¹

Yet the responses to ethical issues from cosmetics companies vary considerably depending on their size, markets, brands and specific philosophical approaches. Companies that represent luxury brands, including Chanel, Louis Vuitton Moët Hennessy (LVMH), Hermès and others are highly sensitive to brand image and often will not work with suppliers that don't consider the social and environmental aspects of raw material sourcing.²²

Sustainability, fair trade, and organic sourcing are only part of the landscape for ethical sourcing. Increasingly, ABS issues are emerging related to gaining access to traditional knowledge and ingredients new to the market. As noted, awareness of the Convention on Biological Diversity (CBD)



Seed of the jojoba shrub - native to the Sonora Desert in North America, contain a liquid wax frequently used in hair products



Producing shea butter, Burkino Faso

has increased within this sector in the last ten years, but there remains significant confusion around what exactly ABS is, and how it relates to industry practices. Discussions of ABS within this sector regularly veer into the sourcing of raw materials – or biological resources – which are outside the scope of ABS and the Nagoya Protocol, rather than the intent of the activity for which they are utilised.²³ While raw material sourcing is important for the broader objectives of the CBD, in particular those on sustainable use, it does not in itself include the type of research arrangements typical of biodiscovery, or bioprospecting.

Large companies within the cosmetics industry typically have in-house teams of lawyers and established affiliations with professional organizations and are thus aware of ABS issues and obligations, although many struggle with their practical implementation. Some companies see ethical sourcing practices, ABS and conservation as a way to differentiate themselves in the market. “Although this slows down the process we cannot afford to make mistakes”, remarked one representative. Other companies may be disinclined to spend money and time this way, particularly if there is a danger of a public relations backlash. In some cases, ABS requirements and ethical sourcing approaches are gradually being integrated into contracts between brand companies and suppliers, and/or material

transfer agreements. These cover any research on or use of traditional knowledge or new genetic resources, and aim to ensure that the intermediary that has accessed the resources and/or knowledge has obtained prior informed consent (PIC) and signed appropriate agreements.

Certification and standards

A range of environmental and social certification systems and standards has developed to specifically address the issues raised by the cosmetics sector. Some emphasize the way in which ingredients are supplied whilst others aim to guarantee the quality and safety of the final consumer product. Certification schemes relating to the sourcing of raw materials include those for fair trade, organic, and ecological or sustainable harvesting. FairWild²⁴, for example, focuses on the sustainable and ethical sourcing of ingredients and incorporates the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants, and is unusual in that it addresses wild-harvested species. Several certification schemes include guidelines on permitted ingredients and minimum thresholds for natural and organic cosmetic products. Some, such as Cosmos and NaTrue, focus specifically on cosmetics, while others such as Green Seal, EcoCert and the Soil

Association include cosmetics among a wider spectrum of products and processes they certify.

An important new standard to emerge in recent years is that developed by the Union for Ethical BioTrade (UEBT), a non-profit organization that promotes “the sourcing with respect” of ingredients that come from biodiversity.²⁵ The UEBT, which is a verification system with a membership logo rather than a product label, places a significant focus on companies’ operations and supply chains for natural ingredients, requiring transparency-based negotiations, compliance with ABS, and sourcing based on equitable principles and respect for traditional practices. UEBT members, most of which are companies working in the cosmetics sector, must agree to comply with the Ethical BioTrade Standard, which is recognized by the ISEAL Alliance, an umbrella group for social and environmental standards. The Ethical BioTrade Standard includes requirements that basic ABS principles are adhered to, including fair and equitable benefit sharing, respect for the rights of actors, legal compliance and sustainable use.²⁶

Efforts have also been made to standardize corporate social responsibility approaches in this sector. The Grasse-based Natural Resources Stewardship Circle, for example, brings together major companies involved in the cosmetics, perfume, flavour and fragrance industries to guide them in interactions with indigenous and local communities.²⁷

In response to government regulations relating to safety, efficacy, and quality, and consumer demand for fair trade and sustainably sourced raw materials, traceability within cosmetics supply chains is becoming increasingly critical. There is a range of schemes with requirements for documentation and safety assessment of both ingredients and products. Good Agricultural Practice (GAP) is rapidly becoming the standard for cultivated material, alongside the use of Good Manufacturing Practice (GMP) for the manufacture of products.



Many of the certification programmes and standards described above are serious and well-developed, and provide consumers with a real choice in their purchases. But there is a pressing need for collaboration and streamlining of programmes and messages. Because there are so many certification schemes and standards emerging from different regions and countries, the message to consumers is often confusing, and openings are created for groups to make claims without any basis. Within industry many are skeptical of the value of certification, seeing it as something that amounts to little more than greenwashing, on a par with the claims for “natural” – harmless, and giving consumers what they want, which is a sense of doing the right thing and being close to nature. As an ingredient company manager said: “Yes, we have products certified by at least six different programmes, we follow certain rules – if our customers want certified materials, we do that. In the end, we pay them money to be certified, it is a kind of scam. When certain companies don’t like a standard, they just start a new programme. When non-profits think a programme is greenwashing they try to launch the “true” standard. In the end, the market gets frustrated by so many different labels and certifiers.”

There is clear evidence, however, that certification and standards play an important role in guiding companies to develop good practice and providing informed guidance to consumers. A 2013 survey, for example, found the UEBT standard to be a useful tool for 96% of member companies,²⁸ while a global survey revealed 81% of consumers having more faith in sourcing practices that are externally verified, and 72% paying close attention to environmental and ethical labels when buying a product.²⁹

RESEARCH, DEVELOPMENT AND TECHNOLOGICAL CHANGE

PRESSURE TO INNOVATE

An estimated \$9 billion is spent each year on R&D in the cosmetics industry.³⁰ However, investments and approaches to R&D vary enormously within this sector. On one end of the spectrum, companies minimally process raw materials to produce simple products for local sale, others process plants and marine organisms into extracts or essential oils, some focus on time-tested formulations and do not have significant R&D, while , on the other side of the spectrum both small and medium sized intermediary companies and multi-national companies with large R&D budgets undertake advanced research on new ingredients and delivery systems. A significant amount of novel R&D takes place within intermediary firms which may screen material, extract active ingredients, undertake compatibility and stability tests, and/or conduct clinical trials. Ingredients, which are usually supplied by local traders or importers, are then worked into a "frame formulation"³¹ before being supplied to larger companies which will do their own formulations for specific products.

There is enormous pressure on companies to constantly innovate in order to differentiate products to attract new customers and gain a marketing advantage. Innovation does not necessarily imply entirely new ingredients and may, for example, focus on well-known ingredients already developed in the food sector but not yet incorporated in cosmetics.³² At one time, innovation in this sector focused primarily on packaging, but today extensive R&D leads to specialized formulations to address more sophis-



Pomegranate extract is incorporated into sun protection products and anti-aging formulations

ticated consumer needs. Brands, for example, now launch every six months instead of every two years, requiring a constant stream of new products.³³

Technological advances in the cosmetics sector have typically followed those in the pharmaceutical industry, and include high-throughput screening, molecular modelling, screening libraries and knowledge-based screening.³⁴ This type of advanced research, undertaken to determine the activity, effectiveness and safety of an active compound is however the exception rather than the rule in this industry.

Once isolated, active compounds must be made viable through stabilization, they must be able to penetrate to deeper layers of the skin, and/or they must be delivered as a fragrance. Delivery systems that stabilize, protect and enhance cosmetic activities on the skin are a growing

and significant part of industry R&D today, and most are patented. Nanotechnology is increasingly used in patch delivery and time-release applications, and the cosmetics industry holds a large portion of nanotechnology patents in the US. As an example, L'Oréal, which spends \$600 million of its \$17 billion annual revenues on research, was the industry leader in nanopatents in 2009.³⁵

SECTORAL CROSS-OVER

One way cosmetics companies are gaining market advantage is by drawing on the science and technology of other sectors such as pharmaceuticals (cosmeceuticals), food (nutricosmetics), and biotechnology. Cosmeceuticals are an important new market, incorporating products that include active ingredients with medicinal properties such as skin photo-protective agents, anti-oxidants, and – by far the largest category – products that slow the effects of aging.³⁶ The main categories of cosmeceuticals today include antioxidants, peptides, growth factors, and combination products. Retinoids are used to speed up skin renewal and alpha hydroxy acids are used in chemical peels. These products are usually more expensive than others, and are produced by the largest companies, such as Estée Lauder, Lancôme and Shiseido, with in-house research programmes.³⁷ Lower-cost alternatives have also emerged, giving rise to the so-called “masstige” – or prestige for the masses – product.³⁸

In a parallel development, nutricosmetics, or “beauty foods”, are emerging as a significant new market, particularly in Japan and Western Europe. Ingredients such as collagen, lycopene, lutein, green and white tea, *Aloe vera*, grape seed and probiotics have all been used in food products with beauty claims, primarily to stave off the signs of aging and typically targeting skin issues from the inside out.³⁹

The interface between biotechnology and cosmetics companies is also growing. A biotechnology company, for example, may do research on gene expression for collagen and may then work with a cosmetics company to do the

screening to discover novel targets. Industrial biotechnology companies are also increasingly producing bio-based chemicals, essential oils, and other ingredients for the cosmetics and personal care sector.

Crossovers between these sectors require cosmetics companies to walk a fine line between different standards and legal systems. If cosmeceuticals have too high a level of activity, or if nutricosmetics contain ingredients considered to be novel foods or medicines with untested safety, governments may consider the products as pharmaceuticals or food, and seek to regulate them as such, requiring a great deal more expensive testing.⁴⁰ This could increase costs, as well as product development times, and so possibly reduce market opportunities.⁴¹

INDUSTRY INTEREST IN NEW NATURAL INGREDIENTS

While market demand for natural ingredients and products is significant, there are also other ways to develop new ingredients, which compete with natural products research within companies. Moreover, many companies have existing collections of ingredients and extracts, and numerous natural products are already on the market and can be included in products for marketing purposes.⁴² Some of the natural ingredients found to be most innovative in 2013,⁴³ for example, were based on known plants such as palm, comfrey and dandelion, and recent trends indicate a re-invigoration of research into food species or northern hemisphere plants that have long, widespread and documented histories of use. Use of such plants may reduce the risk of companies being accused of misappropriating traditional knowledge and/or resources from developing countries.⁴⁴ Companies that are aware of the Nagoya Protocol are increasingly nervous about their obligations under the Protocol, and the costs and responsibilities associated with gaining access to new natural products. Some companies have responded to this concern by greater use of indigenous species from their own coun-



The potent anti-oxidant properties of green tea are of interest to cosmetics manufacturers Photo: Shutterstock

tries, although this does not necessarily preclude them from following national ABS laws.

Unlike other industries, the success of cosmetics products is extremely dependent upon marketing, and novel breakthrough activities are not usually the defining qualities of a product. Moreover, the process is long and the expense of developing a new ingredient from nature is significant – quality, safety and efficacy, as well as toxicology testing can run to well over a million US dollars. As a result, nature is often seen to be most useful as a template or guide

to compounds that companies can then synthesize, or produce through biotechnology as a “natural” compound.

As remarked a representative from a large company: “Across the industry there is a re-evaluation of natural ingredients in light of the confusion around ABS and the danger of negative public relations – it is important to do it right, but how can industry move forward and do ABS right without simple direction from governments?” With marketing and image an enormous part of this industry, the threat of a public relations disaster can outweigh the marketing gains resulting from the cachet of a novel natural ingredient.

Regulations and existing lists of plants authorized for use also impede the development of new natural ingredients. In China, for example, the State Food and Drug Administration relies on an inventory of existing, approved, cosmetic ingredients to determine whether or not a product is safe and can be sold. This acts against the inclusion of new ingredients in products.⁴⁵ Similarly, in the Republic of Korea the wide-ranging use and market recognition of *Centella asiatica* in anti-aging products, combined with the expense of getting new product recognition, means that expanding R&D to find new applications of existing species such as *Centella* makes good business sense.⁴⁶

INDUSTRY INTEREST IN TRADITIONAL KNOWLEDGE

Although the price and effectiveness of products remain central to consumer choice, the “story” of products and ingredients is also paramount, especially for species and ingredients with an interesting background, origin or history of use.⁴⁷ Use by the indigenous Himba in northwest Namibia of perfume plants of the *Commiphora* genus, for example, paints an evocative picture of timelessness and tradition, and accompanies descriptions of the R&D undertaken on these plants by major cosmetics companies. “The cosmetics industry needs a new marketing story each year and therefore needs new materials to tell

this story”, remarked one commentator, emphasizing the continued reliance on new and exotic ingredients and the ways biodiversity can provide a competitive advantage and inspire product lines.

Consumer interest in what have been termed “ethnic” or “exotic” ingredients has been sustained and has even grown in recent years. These ingredients come with stories about traditional uses of plants, and consumers associate those that “hail from distant shores with better health and more effectiveness”.⁴⁸ A number of companies are focusing on Ayurvedic and Chinese traditional medicine, as well as less formal traditional medical systems, as a source of leads. Ingredients long used traditionally have the advantage of having been proven safe over generations of use, and might more easily pass through the regulatory process.

While some companies are interested in the traditional use of natural ingredients, others view traditional knowledge as a potential minefield, given the difficulties associated with obtaining PIC, and developing workable agreements with groups with whom they may have little familiarity. Other companies are hesitant to incorporate traditional knowledge into their R&D since this might call into question their ability to patent a product or ingredient. As one researcher at a large company that undertakes advanced research said: “If traditional knowledge is there, in a way it makes the plant less useful to us. We need to find something with intellectual property protection, and traditional knowledge would reduce its patentability because it is “prior art.” So in a way the ideal is to find completely unknown things that have efficacy....”

GROWING IMPORTANCE OF PATENTS

Patents are becoming an important part of R&D strategies for cosmetics and personal care products, with natural ingredients and extracts accounting for 49% of all patent activity in this sector between 1990 and 2009, 34% of these attributed to plants.⁴⁹ The species most mentioned

in patent applications are those already long established in the trade, including *Aloe vera* (386 patent records), followed by *Centella asiatica* (141) and *Ginkgo biloba* (92).⁵⁰ Companies that are most active in filing patents tend to be those with the strongest market presence, with L’Oréal topping the list at 6,325 patent applications and grants in 2010, followed by Procter & Gamble (4,495), Kao (2,252), Unilever (2,751) and Shiseido (1,727). In 2009, the cosmetics industry accounted for 10% of all patents granted in the European Union.⁵¹

The short shelf life of cosmetics brands, and expense involved in filing patents, means that companies have very different patenting strategies. Ingredient and intermediary companies, for example, might prefer to avoid the expense associated with the filing of patents, but still want to protect their ability to sell a novel ingredient to multiple customers over time. “We would rather publish our findings as a strategy to block competitors”, remarked a representative from an ingredients company. “If we have a new ingredient and take it to L’Oréal they may patent it and then block others – which restricts our own market. It is therefore in our interest to publish these findings”. Often, competitors will publish frame formulations, where compatibility and stability and ingredients are combined to support a certain claim. Once this formulation is published, patenting becomes impossible”.

A proliferation of low-quality patents in this sector has led some to question whether patenting is simply a defense strategy to secure a competitive position and prevent further R&D, or whether there is indeed invention and innovation involved.⁵² As stated by one critic: “Patents cover incremental innovations – taking plants that are unknown in the North and extracting an active compounds, using known extraction processes. The patent may cover only a minor change that improves the extraction process. It is not very innovative.”

Although not a legal requirement in many countries, biodiversity-based patents in the cosmetics sector have also

been criticized for their lack of disclosure of the origin of genetic resources and associated traditional knowledge, and absence of proof of benefit sharing. These omissions have led to accusations of misappropriation.⁵³ In fact, the tendency for patents to facilitate claims by companies to genetic resources or traditional knowledge without the consent of countries or traditional knowledge holders, or a plan to share benefits with these groups, has led some companies to adopt a no-patents strategy for ethical and marketing purposes. Remarked a researcher at one such company, "I want to be proud of what I do and share value where it is created. I want to be sure that everyone who contributes will receive something. The global context is changing and public image is more and more important – we have this profile which stands us ahead of our competitors." As an alternative strategy, companies may veer away from patents associated with traditional knowledge or with countries considered to be "controversial" and prone to making accusations of misappropriation. Bodies such as the UEBT have developed principles on patents and biodiversity which provide guidance to members using patents to ensure support of the objectives of the UEBT BioTrade standard and the CBD.⁵⁴

IMPLICATIONS OF MARKET AND RESEARCH TRENDS FOR ABS AND IMPLEMENTATION OF THE NAGOYA PROTOCOL

There are manifold implications of these trends for ABS and implementation of the Nagoya Protocol. On the one hand, there remains a great deal of uncertainty, an absence of understanding about ABS, and a lack of common ground among stakeholders.⁵⁵ It is also not clear to many companies when ABS begins and ends, and which activities the Nagoya Protocol addresses. It is difficult and expensive to do cosmetics research today and most

companies – in particular the intermediary ingredient supply companies that source raw materials or investigate traditional use – do not have deep pockets. Suppliers and small companies working on the ground with communities are more grounded in local realities, but they often don't have the capacity to engage in lengthy, complex negotiations or to understand the different legal measures applying to biotrade and biodiscovery. Companies thus need a great deal of support and guidance to understand and implement ABS measures.

Companies in this sector recognize that the Nagoya Protocol can help stop "the really bad cowboys" but they are concerned that its implementation could make ABS more difficult rather than easier, and that this could have financial implications for their business models. In some cases, even companies trying to do the "right thing" have had bad experiences, including receiving significant fines for alleged "biopiracy" .. Increasingly, the private sector is seen as an important partner for ABS and there is definitely increased interest to implement ABS but, as one commentator observed, there may be a "breaking point" at which "companies may decide it is no longer worthwhile to pursue natural products... The consumer is buying the notion of feeling good so there can't be a negative association".⁵⁶

On the other hand, the rise of natural and active ingredients in cosmetics, increased demand for "stories" of traditional use, and consumer demand for environmentally and socially responsive products, mean that companies will continue to prospect for novel ingredients. With its dependence upon marketing and engagement with UEBT and other groups promoting awareness of ABS and the CBD, the sector is ripe for setting in place best ABS practices.

THE NAGOYA PROTOCOL: RESPONDING TO SCIENTIFIC, TECHNOLOGICAL, POLICY AND MARKET CHANGE

The implementation of the Nagoya Protocol provides an important opportunity to respond to some of the concerns raised by the sector:

Providing legal certainty and effective and streamlined measures – Companies wishing to explore novel ingredients for the cosmetics sector have been faced with an uncertain legal climate, and confusion about where to go for decision-making about ABS agreements. The Nagoya Protocol recognizes this concern and seeks to create an environment of legal certainty and mutual trust by requiring Parties to designate a national ABS focal point that will make information available on procedures for obtaining PIC and reaching mutually agreed terms (MAT). It also requires one or more competent national authorities to grant access (Article 13). The establishment of an ABS Clearing-House (Article 14) for sharing information will help to ensure transparency and enhance legal certainty. The development of model contractual clauses for the cosmetics sector pursuant to Article 19 of the Protocol can provide additional legal certainty and clarity and reduce transaction costs.

Providing clarity on scope – Most cosmetics products use multiple ingredients, many of which are known ingredients with established supply chains that involve little R&D. The Protocol, however, covers genetic resources when these are utilized within the definition of Article 2(c)

of the Protocol and does not cover genetic resources that are accessed and used as commodities. Implementation of the Nagoya Protocol can help to provide guidance to companies, researchers and indigenous and local communities about which resources and activities fall within its scope, thus providing surety and clarity about ABS implications and requirements.

Supporting benefit sharing from the use of traditional knowledge – Traditional knowledge associated with genetic resources is of particular interest to the cosmetics sector which uses the “story” of products and ingredients as an important marketing tool. In some cases, traditional knowledge also serves as a source of leads for developing new products. However, accusations of misappropriation are a major concern for this sector. Through Parties’ implementation of Articles 7 and 12, the Nagoya Protocol can help Parties, companies and indigenous and local communities to ensure that traditional knowledge associated with genetic resources is accessed and used with the PIC of indigenous and local communities and that MAT are established. The establishment of mechanisms pursuant to Article 12 to inform potential users of traditional knowledge associated with genetic resources about their obligations, can assist companies to understand the requirements for obtaining PIC and for the establishment of MAT. The Nagoya Protocol encourages Parties to take into consideration indigenous and local communities’ customary laws and to support the development by indigenous and local communities of community protocols, minimum requirements for mutually agreed terms and model contractual clauses for benefit sharing (Article 12, Paragraph 3).

Improving monitoring of the use of genetic resources – The monitoring of ingredients incorporated into cosmetics products presents significant challenges due to the multiple ingredients and product lines that are involved across several sectors. Through checkpoints established in accordance with Article 17, the internationally recognized certificate of compliance and contracts, the implementa-



Many cosmetics contain beeswax as an emulsifier, emollient or moisturizer



Argan nuts cracked by hand to expose the oil-rich kernel, Morocco

tion of the Nagoya Protocol can help to monitor the use of genetic resources throughout supply chains and provide evidence that PIC has been obtained, that MAT have been established, and that benefits are shared equitably.

Building the capacity of governments, researchers and companies to engage with ABS and changing scientific and technological developments – Understanding of ABS and the cosmetics sector has grown significantly over the past five years among certain users and providers and considerable goodwill exists to comply with the Nagoya Protocol. However, this awareness is often differentiated and there remains much room for capacity development among all provider and user groups as well as other stakeholders. This is well recognized by the Nagoya Protocol (Article 22) which calls for a strengthening of human resources and institutional capacities to ensure effective implementation. The sensitivity of this sector towards allegations of misappropriation suggests that increased raising awareness about the links between patents, PIC and benefit sharing would be especially beneficial, as would enhanced

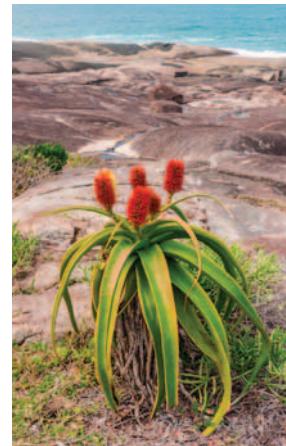
company reporting and communication on their use of biodiversity and sourcing practices. The development and use of voluntary standards, codes of conduct and best practice guidelines pursuant to Article 20 of the Protocol can contribute to capacity enhancement and compliance with ABS requirements.

Developing regional ABS approaches – Many genetic resources and associated traditional knowledge used in cosmetics are widely distributed across political boundaries. Implementation of Article 11 on transboundary cooperation provides important opportunities to investigate common regional or sub-regional approaches for such resources and knowledge. Consideration of the need for and modalities of a global multilateral benefit-sharing mechanism, as required by Article 10 of the Protocol, may also be of relevance in this context.

ENDNOTES

- 1 See, for example, Hammond, E. 2012. The Avon Lady comes collecting Asian medicinal plant. Iconic cosmetics firm seeking to patent numerous Asian medicinal and food plants. Third World Network Briefing Paper 64, May 2012. www.twnside.org.za.
- 2 Regulation (EC) No 1223/2009 of the European Parliament and of the Council on cosmetic products, 30 November 2009.
- 3 ten Kate, K. and Laird, S. 1999. The commercial use of biodiversity. Access to genetic resources and benefit-sharing. Earthscan, London; Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN; Kline & Company, 2011b. Natural Personal Care - Regional Market Analysis and Competitive Brand Assessment. Presentation to the Natural Beauty Summit, America, 14-15 May. New York.
- 4 Mills, N. 2010. Market Research: Naturals Market Resists Recesssion, Posts Strong Global Growth. Kline Newsletter, March; Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN.
- 5 Lubbe, A. and Verpoorte, R. 2011. Cultivation of medicinal and aromatic plants for specialty industrial materials. Industrial Crops and Products 34: 785-801.
- 6 <http://blog.euromonitor.com/2012/04/latest-research-beauty-and-personal-care-2012-now-live-.html>.
- 7 Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN.
- 8 *Ibid.*
- 9 Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN.
- 10 The global anti-aging market was worth \$162 billion in 2008 and is growing at a rate of more than 11% annually, predicted to increase to \$275 billion in 2013. Ghosh, D. 2009. Anti-aging fuels the cosmeceuticals boom. Nutraceuticals World, 1 September.
- 11 Böck, B. 2012. Global top 3 for natural cosmetics: Asia, Europe, USA. Organic News, 15 October.
- 12 Kline & Company, 2011b. Natural Personal Care - Regional Market Analysis and Competitive Brand Assessment. Presentation to the Natural Beauty Summit, America, 14-15 May. New York.
- 13 Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN.
- 14 Kline & Company, 2011b. Natural Personal Care - Regional Market Analysis and Competitive Brand Assessment. Presentation to the Natural Beauty Summit, America, 14-15 May. New York.
- 15 Colipa, the European Cosmetics Association, 2010. Science, beauty and care: innovating for a sustainable future. Activity Report. www.cosmeticseurope.eu/publications-cosmetics-europe-association
- 16 Union for Ethical Biotrade, 2013. Biodiversity Barometer 2013, http://ethicalbiotrade.org/news/?wpfb_dl=26.
- 17 Kline & Company, 2011a. Natural Personal Care - An Overview of the US Market. Presentation to the Holistic Cosmetic Scientific Symposium, 15 March. St Paul, MN; <http://www.loreal-finance.com/eng/news-release/annual-results-2012-871.htm>; <http://investor.colgate.com/releases.fmw?ReleaseType=Earnings>; Estée Lauder, 2012. Annual Report; Shiseido 2012 Annual Report; <http://annualreport.thecloroxcompany.com/performance/>; <http://www.forbes.com/sites/clareoconnor/2013/01/24/frances-young-cosmetics-king-age-34-leads-family-behind-yves-rocher-to-billionaire-fortune/>; The Hain Celestial Group, 2012. Annual Report; http://www.loccitane.com/investors/EN/pdf/20120730_2012_AnnualReport_EN_2.pdf; <http://www.harvpart.com/wordpress/wp-content/uploads/2012/12/Firm-Overview-2.13.13.pdf>.
- 18 *Ibid.*
- 19 J. Chupin, pers. comm., 2012; M. Olivier, pers. comm., 2012.
- 20 CBI, 2011. Botanicals for cosmetics: trends and segments. Centre for the Promotion of Imports from Developing Countries, Ministry of Foreign Affairs of the Netherlands.
- 21 M. Olivier, pers. comm., 2012.
- 22 *Ibid.*
- 23 "Utilisation of genetic resources", as defined by Article 2 of the Nagoya Protocol, means to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in Article 2 of the Convention.
- 24 www.fairwild.org.
- 25 www.ethicalbiotrade.org.
- 26 UEBT, 2012. Towards sourcing with respect. Profile of the Union for Ethical Biotrade.
- 27 www.nrsc.fr.
- 28 M.J. Oliva, UEBT, pers. comm., 2013.
- 29 This links to an emergent trend towards fair trade cosmetic products and an increase in their availability, especially in Europe where up to one-third of the EU population expect fair trade ingredients to be integrated in cosmetic products. www.maxhavelaar.ch. See also: Union for Ethical Biotrade, 2013. Biodiversity Barometer 2013, http://ethicalbiotrade.org/news/?wpfb_dl=26.
- 30 RNCOS Industry Research Solutions, 2010. Cosmetics Trends, December.
- 31 "Frame formulation", as defined by Regulation (EC) No 1223/2009 of the European Parliament and of the Council on cosmetic products, 30 November

- 2009, means a formulation which lists the category or function of ingredients and their maximum concentration in the cosmetic product or gives relevant quantitative and qualitative information whenever a cosmetic product is not covered or only partially covered by such a formulation.
- 32 M. Olivier, pers comm., 2012.
- 33 Kanga, V. 2008. What's new in cosmetics R&D? Most research and new product development is focused on natural materials and actives that combat the signs of aging.
- 34 F. Stahl, Cognis, pers. comm., 2011.
- 35 Ghosh, D. 2009. Anti-aging fuels the cosmeceuticals boom. Nutraceuticals World, 1 September.
- 36 *Ibid.*
- 37 *Ibid.*
- 38 *Ibid.*
- 39 Alieva, A. 2010. The global nutricosmetics market. Interest in nutricosmetics varies by region. www.nutraceuticalsworld.com/contents/view/27144.
- 40 Bird, K. 2010. Regulatory clarity for nutricosmetics proves elusive. 14 October. www.nutraingredients.com/Industry/Regulatory-clarity-for-nutricosmetics-proves-elusive.
- 41 Ghosh, D. 2009. Anti-aging fuels the cosmeceuticals boom. Nutraceuticals World, 1 September.
- 42 B. David, Pierre Fabre, pers. comm., 2012; Alieva, A. 2010. The global nutricosmetics market. Interest in nutricosmetics varies by region. www.nutraceuticalsworld.com/contents/view/27144.
- 43 www.in-cosmetics.com/en/Online-Press-Centre/Press-Releases-old/in-cosmetics-announces-Innovation-Zone-Best-Ingredient-Awards-finalists/.
- 44 See, for example, www.aromtech.com/en/sivu.cfm?id=319.
- 45 CIRS, 2012. Inventory of Existing Cosmetic Ingredients in China. http://www.cirs-reach.com/Cosmetic_Inventory/China_IECIC_Inventory_of_Existing_Cosmetic_Ingredients_in_China.html.
- 46 J. Chupin, pers. comm., 2012.
- 47 M.J. Oliva, UEBT, pers. comm., 2012.
- 48 Gruenwald, J. 2010. Eurotrends: ethnic botanicals: a growing trend. Nutraceuticals World, 6 January. CBI, 2011. Botanicals for cosmetics: trends and segments. Centre for the Promotion of Imports from Developing Countries, Ministry of Foreign Affairs of the Netherlands.
- 49 UEBT, 2010. A review of patent activity in the cosmetics sector in the context of the ethical sourcing of biodiversity. Information note 1 of 4: Trends in patent activity in the cosmetics and perfume sectors.
- 50 UEBT, 2010. A review of patent activity in the cosmetics sector in the context of the ethical sourcing of biodiversity. Information note 2 of 4: Patents, plants and countries of origin.
- 51 Colipa, the European Cosmetics Association, 2010. Science, beauty and care: innovating for a sustainable future. Activity Report. www.cosmeticseurope.eu/publications-cosmetics-europe-association.
- 52 UEBT, 2010. A review of patent activity in the cosmetics sector in the context of the ethical sourcing of biodiversity. Information note 4 of 4: Issues and possible next steps for the cosmetics and perfumes sectors.
- 53 UEBT, 2010. A review of patent activity in the cosmetics sector in the context of the ethical sourcing of biodiversity. Information note 2 of 4: Patents, plants and countries of origin.
- 54 UEBT, 2010. UEBT Principles on Patents and Biodiversity, POL 14, 22 July 2010.
- 55 David, B. 2011. Possible Implications of the Nagoya Protocol for the beauty industry. UEBT International Symposium, May 5, 2011, Paris, France.
- 56 *Ibid.*



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