Union for Ethical BioTrade

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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

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Introduction

Natural products are gaining considerable ground in cosmetics and perfumes and a major proportion of patent activity in these sectors involves ingredients and extracts of natural origin (see Information Note 1 in this series, which focuses on trends in patent activity in the cosmetics and perfume sectors). But what plants are involved in patent activity? Where do these plants come from? The answer to these questions is significant to determine the potential impact of these patents on efforts towards the sustainable use of biodiversity and the equitable sharing of resulting benefits. It is also critical in light of emerging requirements to disclose the country of origin of genetic resources and traditional knowledge as a way to monitor compliance with access and benefit sharing obligations.

This Information Note on "Patents, plants and countries of origin" is the second in a series reviewing patent activity in the cosmetics sector in the context of the requirements of the ethical sourcing of biodiversity and the Convention on Biological Diversity (CBD), and provides data and analysis on the following issues:

- Top plant families, genera and species in patent documents for ingredients and extracts in the cosmetics and perfumes sectors
- Distribution of these species, particularly in relation to countries outside North America and Europe, and
- Existing references to country names, including in relation to the origin of the species, in these patent documents.

A review of patent activity in the cosmetics sector

Biodiversity is recognized as a source of innovation in the cosmetics sector. Yet how is it addressed in the context of increasingly active patenting strategies? Looking at how companies seek and exploit intellectual property protection in relation to natural ingredients is important in light of the complex and often controversial relationship between patents and biodiversity.

Legal and policy measures are currently being considered at the international, regional and national levels to address these concerns. A growing number of companies engaged with the ethical sourcing of biodiversity are also seeking guidance on the design and implementation of patent and biodiversity policies that will recognize and advance the objectives of the Convention on Biological Diversity (CBD).

To contribute to efforts towards a more mutually supportive relationship between patents and biodiversity, the Union for Ethical BioTrade (UEBT) commissioned an analysis of the patent landscape for natural ingredients in the cosmetics sector, as well as study of the types and origins of plants referenced in these patent publications and the types of claims being sought and granted. Research was conducted by Dr. Paul Oldham, Research Fellow at the ESRC Centre for Economic and Social Aspects of Genomics at Lancaster University and renowned expert on patents and biodiversity. The Information Notes in this series provide a summary of the data and main findings in the research conducted by Dr. Oldham on behalf of UEBT.

Plants and patents in the cosmetics sector

In order to find the specific biodiversity implicated in patent activity in the cosmetics and perfumes sector, a search for species names taken from the Species 2000 & ITIS Catalogue of Life was conducted within the series of patent documents identified for ingredients and extracts (see Information Note 1 in this series) [i]. This search found a total of 2,101 full species names, belonging to 944 genera and 388 families in the titles, abstracts and claims of 3,523 patent documents. As shown by Table 1, most of these are from the plant kingdom.

Table 1: Number of species by kingdom

Catalogue or Life	Number of Species
Plantae	1289
Bacteria	385
Fungi	302
Animalia	59
Chromista	41
Arthropoda	14
Viruses	7
Protozoa	2
Archaea	1

It is important to note that patent documents may contain references to species for a range of reasons. References may include species causing conditions (for example, acne caused by *Propionibacterium acnes)* or as media for use in biotechnology and fermentation (for example, *E. coli* or *S. cerevisiae*). Patent applicants may also make reference to the species to which a claimed invention will apply – quite commonly, terms such as mammals or mammalian are used to maximise the scope of claims. Species may also co-occur as multiple ingredients in a cosmetic composition. As a result, patent documents often contain multiple references to species. For example, the species Aloe vera co-occurs with over 100 species, from various kingdoms in patent documents.

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Focusing on plants, the search identified a total of 1,289 full species names, belonging to 182 families and 632 genera. Table 2 sets out the top plant families within the records. Table 3 moves down one level to group the results by the top genera. Table 4 lists the top species involved in patent activity. *Aloe vera*, a species of succulent plant whose leaves contain a range of biologically active compounds and have been long used in herbal medicine, leads the number of references in patent records. *Centella asiatica* and *Gingko biloba*, both used primarily for skin care products, also appear in a high number of patent records.

Table 2: Top plant families (Count of species)

Rank	Families	Count of Species
1	*Rosaceae*	231
2	*Fabaceae*	228
3	*Rubiaceae*	114
4	Not assigned	94
5	*Asteraceae*	58
6	*Oleaceae*	47
7	*Lamiaceae*	38
8	*Arecaceae*	25
9	*Poaceae*	25
10	*Zingiberaceae*	23

Table 3: Top plant genera (Count of species)

Rank	Families	Count of Species
1	*Coffea*	101
2	*Rosa*	92
3	*Prunus*	35
4	*Rubus*	28
5	*Bauhinia*	19
6	*Smilax*	16
7	*Fraxinus*	16
8	*Acacia*	16
9	*Pyrus*	15
10	*Vaccinium*	13

Table 4: Top plant species (Number of patent records)

Rank	Plant species	Patent Records	Rank	Plant species	Patent Records
1	*Aloe vera*	386	13	*Curcuma longa*	35
2	*Centella asiatica*	141	14	*Salivia officinalis*	31
3	*Gingko biloba*	92	15	*Emblica officinalis*	28
4	*Glycyrrhiza glabra*	61	16	*Azadirachta indica*	27
5	*Vitis vinifera*	61	17	*Citrus aurantium*	23
6	*Camellia sinensis*	59	18	*Juglans regia*	23
7	*Persea americana*	51	19	*Panax ginseng*	23
8	*Vinca minor*	49	20	*Chondrus crispus*	22
9	*Prunus persica*	48	21	*Hypericum perforatum*	22
10	*Rosmarinus officinalis*	46	22	*Morus alba*	21
11	*Rhus vernicifera*	45	23	*Sorghym caudatum*	21
12	*Serenoa repens*	38	24	*Vaccinium myrtillus*	21

The origin of plant species

A central question in discussions on access to genetic resources and benefit sharing is the country of origin of these resources. The CBD recognizes the sovereign rights of States over their natural resources, and their authority to determine whether and how access to genetic resources is permitted. Determining the country of origin of the genetic resources or associated traditional knowledge used in products or processes is thus fundamental to monitoring such use of biodiversity, as well as to ensuring compliance with any requirements of prior informed consent and equitable sharing of benefits established by the relevant national legislation. Indeed, negotiations are currently underway in a range of international fora on norms requiring disclosure of origin in patent applications. In this context, it is useful to analyze whether and how the origin of plants is already mentioned in patent documents.

To determine current practices on referencing the origin of resources in patent documents in the cosmetics and perfumes sector, the complete text of patent documents identified as containing species distributed outside Europe and North America were processed for references to country names [ii]. The focus on species originating outside of these

countries responds to the dynamics of the debate on access and benefit sharing, which is characterized by considerations linked to the need to address biodiversity in the context of sustainable development strategies. In total, 378 raw references to country names were found in the sample of 3,252 documents, of which 166 were directly associated with species names. A sample of the resulting data is presented as a concordance table – an index of selected country names, showing their location in the text of the patent documents containing species– in Figure 1.

Figure 1: Country names in patent documents

N	Concordance
1	of gum from Acacia seyal and species of combretum in mixtures with A. senegal using monoclonal antibodies, Food & Agric. Immunol., 10:237-241 (1998) ;
2	in diameter. The plant is native to Sri Lanka, Burma, Indochina, Surinam, South China, Thailand, Malaysia and Indonesia. It is cultivated as an ornamental plant
3	Polypodium leucotomos, are already commercially available in Spain, Portugal, Honduras and the Dominican Republic in the form of capsules for oral
4	coasts of the United States and Canada, but also along the coasts of England, Chile, Peru and elsewhere, and includes the following species: S. caribaea, S.
5	tyrosinase inhibiting extracts from dictotyledonous plant species indigenous to Canada and compositions containing the extracts for the treatment of skin,
6	30% by weight. Balsam pair of the genus Momordica charantia originates from India, but is also grown on RÃ©union Island. It is an annual herbaceous plant
7	leaves of Gymnema sylvestre belonging to the family Asclepiadiaceae native to India and an extract from the dried leaves thereof in an amount of 0.025-50%
8	is a species of the Lecythidaceae family and is known by the vulgar names of brazil-nut, true-nut, castanha-do-para among others. The fruit is called chestnut
9	is used to transform an Aspergillus species host cell, such as A. ozyzae or A. niger in accordance with methods described in Yelton et al. (PNAS USA 81:
10	a member of small genus of Emblica trees, which are native to India, Sri Lanka, Malaysia and China, is much more stable under self-oxidation than L-ascorbic acid
11	Malvaceae is preferably an extract of Hibiscus species, principally an extract from Sudan tea (karkade, hibiscus, Hibiscus sabdariffa), or an extract from Malva
12	bonds. Gum arabic is the dried exudate from species of the acacia tree (Acacia senegal) found in various tropical and semitropical areas of the world. The acacia
13	method as defined in claim 6 wherein said member of the genus Smilax is Smilax china Linneaus. eaus.
14	, a member of small genus of Emblica trees, which are native to India, Sri Lanka, Malaysia and China, is much more stable under self-oxidation than L-ascorbic acid
15	It is also known as milk vetch root (referring to astragalus species that grow in the United States) and Huang-Qi. Astragalus has often been used by practitioners of
16	of the genus Tephrosia are subtropical plants widely distributed, in particular in India and in Sri Lanka. A species of the genus Tephrosia that is particularly
17	is also the bean family (Leguminosae) plant mainly discovered in a sea_bream|tie[Thailand country. This plant has a red sap, The tuber has been used as a raw
18	The genus Adenanthera includes eight species, above all in tropical Asia, in Australia and in the Pacific region. Besides Adenanthera pavonina, there is also
19	also called Siraitia grosvenorii. Lou Han is native to the People's Republic of China and Japan and is an edible fruit having an intensely sweet taste. It is reputed
20	is becoming popular for treating ringworm (Tinea species) among children in rural Kenya (29). Application of a paste made from neem leaves and turmeric in 4:1
21	It is also known as milk vetch root (referring to astragalus species that grow in the United States) and Huang-Qi. Astragalus has often been used by practitioners of
22	filaginoides (Conyza filaginoides) is utilized as crude drug by the plant of a Mexico by the plant of chrysanthemum family (Compositae), Moreover, it
23	officinalis , a member of small genus of Emblica trees, which are native to India, Sri Lanka, Malaysia and China, is much more stable under self-oxidation than
24	and cleansing the blood. The Curcuma plant family has been used for centuries in Thailand, Java, and Bali to beautify, perfume, tighten and deodorize the skin.
25	can, for example, also be extracted from the following plants not native to Australia; Polygoman hydropiper Azadirachta indica (neem) Chrysanthemum
26	small genus of Emblica trees, which are native to India, Sri Lanka, Malaysia and China, is much more stable under self-oxidation than L-ascorbic acid itself and
27	) is a plant of the Solanaceae family, genus Withania, with distribution in Nepal, the western India, and South Africa. The melanin production suppression
28	of nine distinct species of bacteria from microbial mats originating from French Polynesia Characteristics of each of these EPSs are provided in Table I
29	elengi which is an indeciduous small tree of the family AKATETSU grown in India and Nepal, (B) Eugenia jambolana which is an indeciduous tall tree of the
30	gum arabic, especially the modified gum arabic derived from the species A. senegal , can be evaluated by measuring the average particle diameter of droplets

As is clear from Figure 1, references to country names may be found within the whole text of documents for a range of reasons. These country names may be in the context of literature references, the location of a company, the name of a species (for example, *A. senegal*) or to the use given to particular plants in particular countries (for example, the use of Tinea species to treat ringworm in children in Kenya). Figure 1 also reveals that disclosure of origin may refer to the entire distribution of the species across multiple countries.

A similar search was conducted within these patent documents for references to country names and terms linked to traditional knowledge. The origin of traditional knowledge is equally relevant in the context of ensuring compliance with CBD principles of prior informed consent and equitable sharing of benefits. A total of 250 raw results were returned on a limited set of experimental search terms, including “traditional medicine,” “traditionally,” “natives,” “native people,” “indigenous peoples.” Figure 2, however, demonstrates that these references are generally not linked to disclosure of origin, but rather to literature citations of prior art, descriptions of known uses of particular plant materials, or use of the term native to describe compounds. As a result, the available data suggests that disclosure of the country of origin of biological materials and associated traditional knowledge is presently low.

Figure 2: Traditional knowledge-related terms in patent documents

N	Concordance
1	surgery, bronchial asthma and upper respiratory infections. (Encyclopedia of Chinese Traditional Medicine , ShangHai Science and Technology Press, ShangHai, China,
2	origin and their use is known in cultures throughout the world. In India science of herbal medicine known as "ayurveda" medicine, which gives us the modem term
3	Molina-Torres, J., et al. Antimicrobial properties of alkanides present in flavoring plants traditionally used in Mesoamerica: affinin and capsaicin, Journal of Ethnopharmacology,
4	from China and Lycium chinense from South Korea, which are known as a Chinese herbal remedy used in the Oriental medicine. Also in Japan, Kumazasa has been used
5	B 1 1001% -Eumulgin B2 1,505% Fraction B : -Extraits de protÃ©ines totales natives dÃ´Hibiscus selon l'exemple n° 1 prÃ©citÃ© 8109% Fraction C : -Allant6ine
6	be mined from veins which are two to three feet wide and deep, but many yards long. Natives on every continent have used volcanic ash for centuries both internally and
7	[0160] A whey milk comprising Lactobacillus strain and two Streptococcus strains traditionally used for the production of yoghurt, was obtained from a lactoserum powder
8	and through the ages has found wide applications as a food, a food additive and as a traditional medicine of every region in which it has been cultivated. The leaves, and both
9	daidzein for use in this production method include soybeans, Ge Gen Tang (Chinese traditional medicine, also known as Kakkonto), red globe grapes, alfalfa or others.
10	en prÃ©sence d'un excÃ´s d'acide gras et sont Ã©laborÃ©s avec des protÃ©ines natives. Ceci est explicitÃ© ci-aprÃ´s. La Demanderesse propose en fait l'utilisation de
11	excessive numbing of traditional mouth-pain ingredients like benzocaine and lidocaine traditionally used in various gels. Benzocaine and lidocaine create an unpleasant
12	for medicinal benefits has played an important role in nearly every culture on earth. Herbal medicine was practiced by ancient people in Africa, Asia, Europe, and the
13	COSMETIQUES OU DERMOPHARMACEUTIQUES CONTENANT DES PROTEINES NATIVES DE LA PLANTE ARGANIA SPINOSA | KOSMETISCHE UND/ODER
14	of Rosa multiflora Root [0048] Rosa multiflora root was purchased from a shop for herbal medicine at Kyoungdong Market in Seoul, Korea. 15L acetone was added to 3000
15	follicle and the sebaceous gland. Protoberberines are present in many plants used in traditional medicine and in dietary complements. For example, Goldenseal (= Hydrastis
16	lacustris L., Spongilla. fragilis Leidy , and Ephydatia fluviatilis , have been used by native people to prepare folk remedies (e.g. Bardiaga) for centuries. However, these
17	also known as Red Reishi, Ling Zhi (in China), Yeong Ji (in Korea), has long been used traditional medicine of Asian cultures. See, e.g., S. Aung, "The Clinical Use of
18	of the extracts or process products in cosmetics or topical applications. Applications in traditional medicine are known for a very wide variety of plants. Thus, in traditional
19	of the different constituents of the compositions according to the invention are those traditionally used in the cosmetic field. These compositions constitute, in particular,
20	en un hydrolysat chimique ou enzymatique prÃ©parÃ© Ã partir de protÃ©ines natives. 8. Composition cosmÃ©tique selon l'une quelconque des revendications 2 Ã 6,
21	and Meienhofer (Eds.), Academic Press, NY, 1-284, 1979. * Blumenthal et al., In: Herbal Medicine, Expanded Commission E Monographs, 1 st Ed., Integrated Medicine
22	Symposium of the Phytochemical Society of Europe-Phytochemistry of Plants used in Traditional Medicine, University of Lausanne, 29 September-1 October 1993. In press on
23	Hexoseoxidase aus Chondrus crispus Relative Rate Substrat Rekombinantes Enzym Natives Enzym, diese Arbeit Natives Enzym, Sullivan und Ikawa, 1973 D-Glucose 100
24	Pung Chang. Decoction of leaves and roots is taken as an appetite stimulant in traditional medicine. The flowers may be used externally for treating skin diseases such
25	1 Ã 3, caractÃ©risÃ©es en ce que le poids molÃ©culaire des protÃ©ines natives se situe dans un intervalle allant de 10 000 Ã 18 000 daltons. 7. PrÃ©parations
26	as arthrosis, loss of appetite and sleeping disorders. Moreover Bellis perennis L. is also traditionally used for the treatment of dermatological problems such as acne, eczema,
27	odor absorbers and coloring matter. The amounts of these different adjuvants are those traditionally used in the cosmetic, or dermatological field, and are, for example, from
28	en un hydrolysat chimique ou enzymatique prÃ©parÃ© Ã partir de protÃ©ines natives. 8. Composition cosmÃ©tique selon l'une quelconque des revendications 2 Ã 6,
29	tree ORDER 9: BATALES Family: Gyrostemonaceae Gyrostemon spp. , Aust. natives ORDER 10: ERICALES Family: Ericaceae Heath Rhododendron Vaccinium
30	and P. spicatus . Extracts from jaborandi leaves have been used for many years as a herbal medicine for the treatment of various diseases and disorders (Lloyd, J. U. The
31	novel antimicrobial activity is being actively undertaken. [8] As a relatively well-known herbal medicine having antimicrobial activity, berberine, which is an alkaloid contained in
32	Molekulargewicht von etwa 600.000 hat (Sahm & Wagner, 1973), wogegen HOX ein natives Molekulargewicht von etwa 110.000â€"130.000 besitzt, wie es in Abschnitt 1.8.
33	YS8 and SFi3 of S. thermophilus, and the strain YL18 of L. bulgaricus, which are traditionally used for the manufacture of yoghurt. Table VI below illustrates the
34	crush the root and rhizome, and use the obtained juice to wash their hair. These native people are also reported to have boiled the root, and used the decoction to wash

Yet completing the information on the origin of plant species referenced in patent documents is not simple. There are challenges in the availability of distribution data within taxonomic records, as well as in the accuracy of such information. Indeed, in the Catalogue of Life, distribution data was available for only 43% of the species identified in the patents. Furthermore, some species may be classified in terms of their origins but in reality be cultivated elsewhere. Moreover, distribution data may refer to a country, a place or a region, and references to countries are not uniform.

For species referenced in the patent documents pertaining to ingredients in the cosmetics and perfumes sectors, efforts were made to determine regional distribution, as shown in Table 5. In this table, the figures in bold correspond to the total number of records for a particular region, with the remaining numbers showing records for plant species that also occur in other regions [iii]. This data demonstrates that plants frequently co-occur in various countries and regions, by virtue of natural distribution or because they have been introduced.

Table 5: Plant species by regional distribution

Distribution	North America	Central America & Caribbean	Asia	Africa	Oceania	Europe	South America	Middle East
North America	426	113	4	2	89	3		2
Central America & Caribbean	113	181	12	6	66		6	1
Asia	4	12	175	35	22	32	6	7
Africa	2	6	35	166	17	18	9	9
Oceania	89	66	22	17	143	12	7	4
Europe	3		32	18	12	60	3	9
South America		6	6	9	7	3	35	1
Middle East	2	1	7	9	4	9	1	13

In particular, on the basis of available distribution data, a search was conducted for plant species involved in patent activity and distributed outside North America and Europe. Of the 1,289 species identified in the patent data, 806 plant species fell within this category. Table 6 shows the top results in relation to the countries and areas of distribution for these species. Table 6 makes clear that patent activity for cosmetics and perfumes involving species distributed outside Europe and North America is significant. Based on this list, the top patent assignees for Non-European or North American species is provided in Table 7.

Table 6: Non-North American or European plant species by distribution (Number of species)

Distribution	No	Distribution	No	Distribution	No	Distribution	No
Madagascar	54	Myanmar	13	Seychelles	7	Ghana	6
China	38	Japan	13	Algeria	7	Peru	6
Caribbean	34	Africa	12	Ethiopia	7	Philippines	6
India	23	Indonesia	12	French Guiana	7	Sri Lanka	6
Bangladesh	21	Kenya	12	Papau New Guinea	7	Colombia	6
Oceania	19	Angola	11	S. Trop. America	7	Zaire	6
Australia	17	Mauritius	10	Taiwan	7	Hainan (China)	5
Afghanistan	16	Andaman Is	10	Argentina	7	South Africa	5
Tanzania	15	Cambodia	9	Laos	7	Surinam	5
Brazil	15	Nepal	9	Mexico	6	Thailand	5
Bhutan	14	Vietnam	9	Mexico to C. America	6	Ivory Coast	5
Cameroon	13	Malaysia	8	Mozambique	6	Mauritania	4

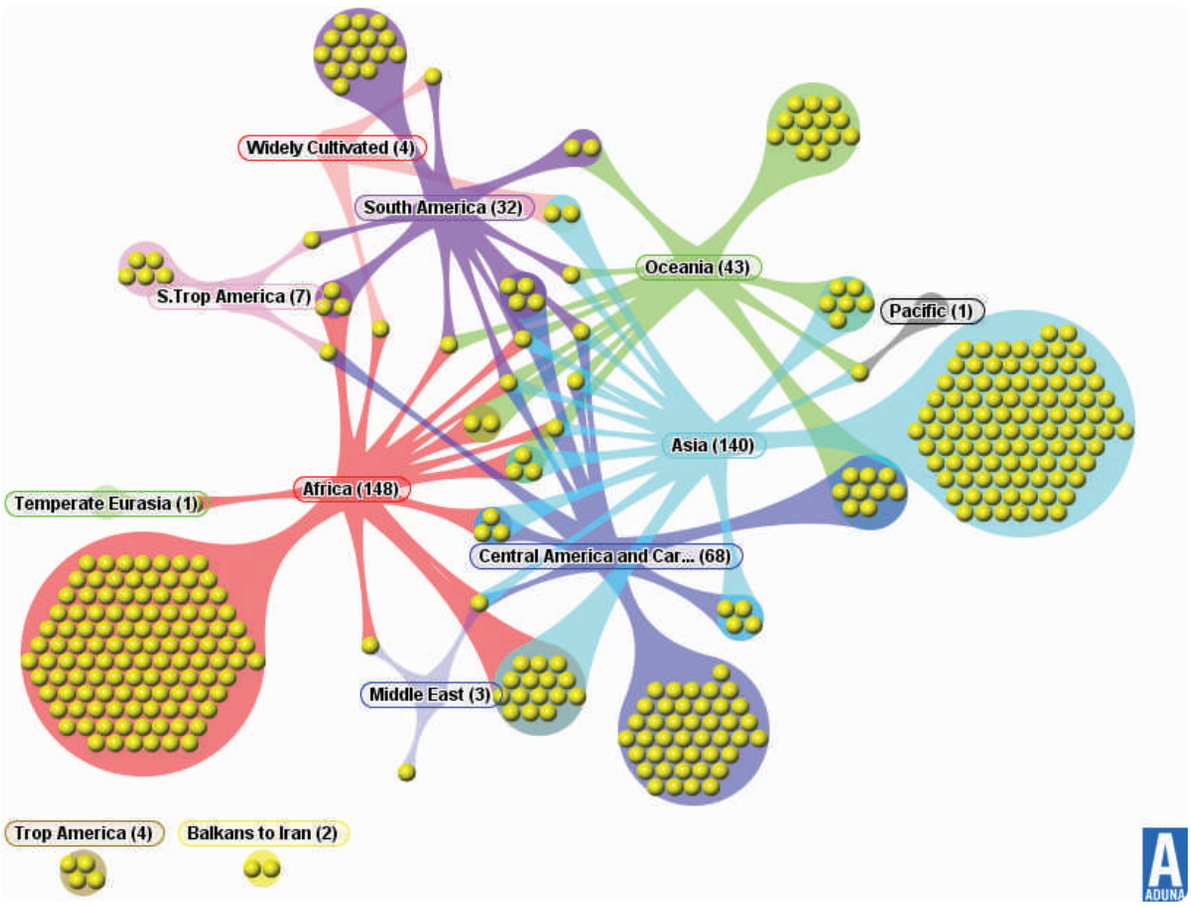
Table 7: Top Patent Assignees (Number of patent records)

Patent Assignees	Not Europe / North America	Patent Assignees	Not Europe / North America
L'OREAL SA	150	NATREON INC	18
COGNIS FRANCE SA	59	HINDUSTAN LEVER LTD	18
LVMH RECH	53	SEDERMA SA	18
LVMH RECH GRP INTERET ECOMONIQUE	32	COSMEDERM INC	16
LAB SEROBIOLOGIQUES SA	28	COUNCIL SCI & IND RE INDIA	16
AVON PROD INC	28	UNILEVER HOME & PERSONAL CARE USA DIV CO	16
PROCTER & GAMBLE CO	28	KAO CORP	15
COTY BV	27	COGNIS IP MANAGEMENT GMBH	15
SHISEIDO CO LTD	26	CIBA GEIGY AG	13
BEIERSDORF AG	25	HENKEL KGAA	13
MERCK PATENT GMBH	23	DANISCO AS	12
UNILEVER	22	MIKIMOTO SEIYAKU KK	12
LANCASTER GROUP GMBH	20	CLARINS	12
COTY PRESTIGE LANCASTER GROUP GMBH	19	SILAB SOC IND LIMOUSINE APPL BIOLOGIQUE	12

Distribution across multiple countries

Another conclusion that can be drawn from the analysis of the origin of species referenced in the patent data is that patent activity will frequently affect multiple countries at the level of distribution of species. This is illustrated in Figure 3, which presents an Aduna cluster map of the distribution of species within individual regions. Yellow dots mark individual species and co-occurrence across regions is marked by links from the species to other regions. As highlighted by Figure 3, species will, often, if not regularly, be distributed across multiple countries and regions. This issue is frequently underestimated in debates on the country of origin of biodiversity for the purposes of compliance with access and benefit sharing principles.

Figure 3: Aduna cluster map of regional concentrations of species and co-occurrence



To explore this issue more thoroughly, further analysis was conducted with regards to species from three countries - Madagascar, China and Brazil - in different regions, using additional distribution data from the Global Biodiversity Information Facility (GBIF) [iv]. These countries were selected as some of the most common countries of origin for species in the patent records (see Table 6).

Madagascar

A total of 54 species from Madagascar – and not located in Europe or North America – were identified as the subject of patent activity in the cosmetics and perfumes sector. These are primarily species of coffee, which is indigenous to tropical Africa and certain islands in the Indian Ocean, notably Madagascar. Indeed, Madagascar, as evidenced by a December 2009 report on the identification of seven new species of coffee, may be an important source of endemic coffee species [v]. For the coffee species identified in the patent data, Figure 4 shows the GBIF distribution data.

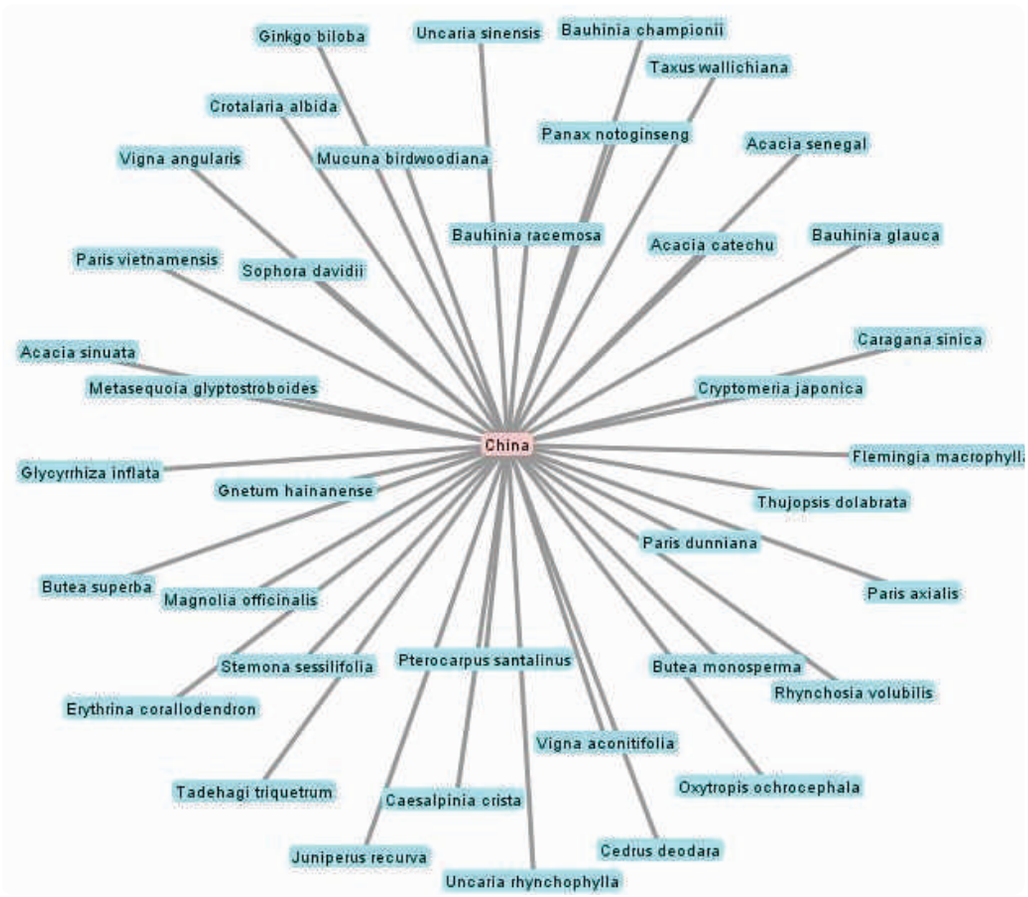
Figure 4: GBIF distribution data Madagascar (Coffea species)

Figure 4 shows that the coffee species concerned are in fact distributed from Madagascar through to the Arabian Peninsula. In addition, it is unclear from the available data whether these coffee species are cultivated outside their area of distribution. Coffee species distributed in Madagascar are listed in six patent documents filed by Sederma, COTY Prestige Lancaster Group, the IRD Institute for Research and Development, L'Oreal and Nestec [vi].

China

A total of 38 species were identified with distribution in China, as set out in Figure 5. Again, it should be noted that this data includes species, such as *Ginkgo biloba*, that may be distributed or cultivated elsewhere. Indeed, species from countries such as China are frequently distributed in other countries and extend into the Pacific. According to the more detailed data from GBIF, from these 38 species, 18 do not also occur in European or North American countries. These 18 species are recorded in 50 patent documents led by Cheil Industries Inc, LVMH, Cognis France, Merck, Advagen, Shiseido, and L'Oréal.

Figure 5: Species distribution China



Brazil

A total of 15 species were identified for Brazil within the cosmetics and perfume data. GBIF data reveals that five of these species have quite wide distribution beyond Brazil and South America. The remaining species, which include *Mimosa tenuiflora, Bauhinia fortificata* and *Inga pezizifera,* are concentrated in northern South America and Central America, and are referenced in patent activity by Cognis France, Merck, Beiersdorf, Laboratoires Serobiologiques, the Lancaster Group and Duke University.

More detailed analysis of distributional data suggests that species contained within patents for cosmetics and perfumes are typically distributed in more than one country. When viewed from the perspective of the access and benefit sharing provisions of the CBD, this poses the challenge that it is groups of countries that are typically affected by patent activity [vii]. Given the broad distribution of these species, how is the country of origin determined? How should prior informed consent and equitable benefit sharing take place in practice? In addition, comparing the relatively limited number of patent documents with the larger number of species involved illustrates the problem of claims over multiple species from the same genera.

Concluding remarks

The research conducted aimed to accurately identify references to species in patent documents for ingredients and extracts within cosmetics and perfumes. These patent documents, over 93,000, were matched against the list of species names from the Catalogue of Life taxonomic database. This revealed 2,101 species of which 1,289 were plants. Analysis of species level data revealed, however, that cosmetics and perfumes patents frequently involve more than one species in reference to a range of technologies, including the use of microorganisms in fermentation and biotechnology based approaches.

A key consideration in the implementation of the CBD principles on access to genetic resources and benefit sharing is the origin of the species and ingredients that are the subject of patent activity. In practice, however, distributional data is difficult to obtain. In the context of the present study, such information was only available for 43% of the species identified. This reflects the limitations of existing taxonomic databases. In addition, research showed that patent activity generally refers to groups of countries rather than individual countries.

Current practices on the disclosure of the origin of species and associated traditional knowledge were also examined. Analysis revealed that disclosure of the country of origin of the plant material is limited and may include references to distribution in multiple countries. Equally, test terms for the knowledge, innovations and practices of indigenous peoples and local communities revealed few results, with references to traditional medicines predominating.

These findings are relevant in the context of the negotiation of a protocol on access and benefit sharing under the CBD, scheduled for completion in October 2010, as well as related discussions taking place in other international fora. The new legally binding protocol is expected to include provisions on the disclosure of origin of materials and traditional knowledge in patent applications, as well as on the introduction of an international certificate system.

Requiring disclosure of the origin of biodiversity and traditional knowledge in patent applications is considered fundamental to allow a more mutually supportive relationship between the objectives of the CBD and the patent system. It would restrict the use of patents for “biopiracy” or the misappropriation of biological resources and associated traditional knowledge. Disclosure of origin could also improve legal certainty and the integrity of applications where such disclosure is accompanied by information that the materials concerned were legitimately obtained. An internationally recognised certificate of origin would complement disclosure requirements by setting out that prior informed consent has been obtained from countries of origin and mutually agreed terms for an equitable sharing of benefits have been established.

Existing debates on disclosure and certificates, however, assume that material employed in patent applications will have a single origin. This assumption may sometimes be appropriate in the case of a pharmaceutical compound originating in a plant, but it does not fit with the data on cosmetics where material is commonly drawn from multiple sources. Indeed, cosmetics and perfumes patent activity is dominated by the use of multiple species distributed in multiple countries and involving knowledge of the uses of such species from multiple sources.

Given the complexity of determining the origin of species used in ingredients in the cosmetics and perfumes sector, a number of practical questions arise. Will patent applicants or their suppliers be required to obtain a certificate from each country within the distribution range of plant species relevant for ingredients and extracts? Equally, will benefit-sharing requirements extend to countries of distribution or only to the individual countries where plant material is being sourced? If so, how might this be achieved and what level or types of benefits would be appropriate? Is some form of multilateral global biodiversity benefit-sharing fund as recently suggested by Africa the appropriate way forward?

As these knotty questions make clear, there are a number of issues that must be addressed for the practical and effective implementation of disclosure of origin requirements and certificates of origin in the context of the cosmetics and perfumes sector.

Endnotes

i. The Titles, Abstracts and Claims of the 93,751 patent documents identified for the general category of ingredients and extracts within cosmetics and perfumes (please see Information Note 1 in this series) were searched for species names from the Species 2000/ITIS Catalogue of Life.

ii. See discussion further down in main text on the determination of this data and the difficulties of accurately determining the origin and distribution of plant species.

iii. This is called a co-occurrence matrix.

iv. The GBIF brings together more detailed information from the major taxonomic collections.

v. http://www.kew.org/news/new-discoveries-coffee.htm

vi. In company-related information, no consistent attempt has been made to group patent assignees to parent companies or to take account of mergers and acquisitions.

vii. In addition, given that the taxonomic record focuses on the distribution of species from field collections based on latitude and longitudinal data, it is unclear how many of these plants species are cultivated within or outside these regions

For more information

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