

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Market Brief in the European Union
for selected natural ingredients derived from native
species

Genipa americana
Jagua, huito



UNITED NATIONS

Note

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by

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PREFACE

The **BioTrade Initiative** is UNCTAD's programme that supports sustainable development through trade and investment in biological resources in line with the Convention on Biological Diversity. The specific objectives of the BioTrade Initiative are: (i) To assist developing countries in the formulation and implementation of National BioTrade Programmes; (ii) To assist Inter-Governmental Organizations in the formulation and implementation of Regional BioTrade Programmes; (iii) To provide inputs to international policy making processes related to trade and biodiversity; (iv) To carry out technical assistance on issues related to trade and investment related to biotrade.



The **BioTrade Facilitation Programme (BTFFP)** for biodiversity products and services aims at assisting partners in developing countries on issues related to trade promotion of specific sectors, which have high value-adding potential and can generate local income by involving local and indigenous communities, while contributing to the biodiversity conservation. Priority product groups include edible plant products (e.g. fruits and nuts); food ingredients (e.g. natural colouring and flavouring materials); cosmetic and pharmaceutical ingredients (e.g. medicinal plants, essential, fatty and vegetable oils), fibres, latex, resins, gums and gum by-products.

The **BTFFP** addresses specific developing countries' needs such as market information, market access strategies, development of methodological approaches, best-practices, as well as advocacy and participation in policy making processes (e.g. trade barriers, certifications, sustainable use, etc.). Selected countries from Latin America (the Andean and Amazonian regions), Africa (the eastern and southern regions) and Asia are currently part of the BTFFP. The BTFFP is an official partnership of the World Summit on Sustainable Development (WSSD), and counts with the financial support of the Governments of Switzerland and the Netherlands. The International Trade Centre (ITC), serves as the Programme's technical advisor. Other current BTFFP partners include: BioTrade National programmes, PhytoTrade Africa, Programme Bolsa Amazonia, the Dutch Centre for the Promotion of Imports from Developing Countries (CBI), and the Swiss Import Promotion Programme (SIPPO).

This document is part of a series of market briefs on selected natural ingredients derived from native species in beneficiary countries of the **BTFFP**. It is addressed to corporate executives, partners of the **BTFFP**, officials of international and trade promotion agencies, representatives of nongovernmental organizations and researchers. The market brief seeks to provide balanced information and analysis of trade opportunities. Each study may be read by itself, independently of the others.

For further information please visit www.biotrade.org

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Abstract

The market brief on *Genipa americana*, profiles the EU market for this native South American species and its derivatives, used as natural ingredients in the personal care and food industries. This document was developed within a series of market briefs on selected natural ingredients derived from native species in beneficiary countries of the BTFP.

The underlying market brief, on *Genipa americana*, is divided in eight sections. Sections 1 to 5 profile the EU market for *Genipa americana*. The brief starts with providing a description of the species including, botanical name, common names, trade names, HS codes, countries and regions of origin, methods of cultivation/harvesting, importance to the native biodiversity of the country of origin and traditional use. The major national markets within the EU for these products are highlighted and current trends are described. Furthermore, (statistical) market information on consumption, production and trade, and information on trade structure and opportunities for exporters is provided

Section 6 describes the requirements, which have to be fulfilled in order to get market access. It is of vital importance that exporters meet the requirements of the EU market in terms of product quality, packaging, labelling and social, health & safety and environmental standards. Section 7 provides indicative prices and price developments for the selected products differentiated by trade channel and value added as well prices of substitutes. It also provides sources of price information.

The final Section, describes marketing and sales promotion strategies as well as recommendations on different levels: supply chain management, promotion strategies and business-to-business opportunities. This chapter was validated through interviews with buyers, consumers, market experts and other relevant actors in the EU market

Keywords: *Genipa americana*, jagua, huito, genipa, natural ingredients, biodiversity, sustainable use, export, BioTrade Facilitation Programme, trade, market, information

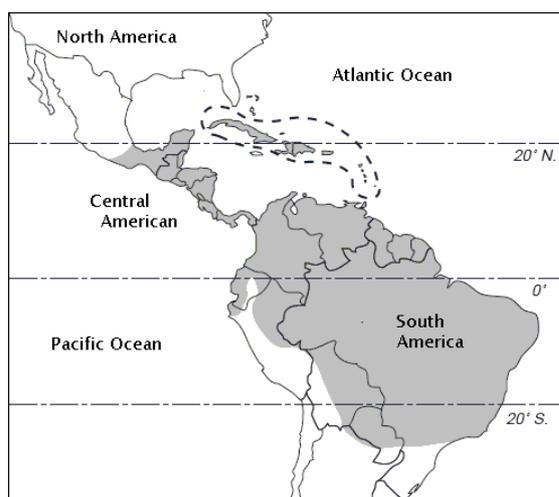
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1 Species description¹

Family:	<i>Rubiaceae</i>
Genus:	<i>Genipa</i>
Species:	<i>Americana</i>
Common Names:	Jagua, juito, huito and genipa (Spanish areas in Latin America), genipap and genipa (English), bois de fer (French) and genipapo (Portuguese)
Parts Used:	fruit, bark, resin and flowers

Genipa americana is a small to medium-sized tree. It is 8 to 20 m tall, but specimens of up to 30 meter are also found. The diameter of the trunk is 30 to 80 cm and it has thick, smooth bark. It has a dense crown and the lower branches grow more or less horizontal, with 10 to 35 cm leaves at the ends. In most of Amazon Basin the trees flower in May to September and give fruit between September and April. It takes up to one year for the fruits to mature. In most trees, bees pollinate the flowers. Its fruit is a large, rounded berry, which is 9 to 15 cm long, 7 to 9 cm wide, weighing between 200 and 400 g. It has a thin and leathery covering a 1 to 2 cm thick layer of soft, yellow-brown pulp. The central cavity contains up to 300 seeds, enclosed in membranes. The seeds are hard, flat and dark brown. They are 10 to 12 mm in length and typically count 10.000 in a kg. Germination is high, but initial growth slow.



Source: Francis, John K. 1993. *Genipa Americana*. U.S. Dep. of Agriculture

Origin

Genipa americana is widely distributed throughout the tropical and parts of the subtropical areas of Latin America. Areas where it grows naturally or where it has been introduced range from Mexico to Argentina and include the Caribbean as well. In most places *Genipa americana* is restricted to the lowlands. The tree may have originated in the Amazon where it grows naturally. It is found especially in the 'várzeas', the part of the Amazon forest that lies next to rivers and is flooded annually for several months. Occurrence of *Genipa americana* also extends into the open forest and the savannah transition zone. It is also common in secondary forests on sites abandoned by shifting agriculture. Although reasonably represented in these vegetation types, its presence is rather scattered except where planted. It prefers areas with

a slightly acid soil, annual rainfall between 1200 and 4000 mm and a mean annual temperature between 18 and 28°C. It tolerates dry periods of up to 6 months, when it sheds its leaves, but it is very sensitive to temperatures near zero.

¹ Sources used: Danida Forest Seed Centre (2003). Seed Leaflet No. 67; *Genipa americana*. Copenhagen. Francis, J. K. (1993). *Genipa americana*. US Department of Agriculture. New Orleans.

Cultivation and Harvest

For fruit production, spacing of 10x15 m is normally recommended and 3x3 m for timber production. Temporary crops such as cassava or cotton can be planted in between to provide shade for the young trees and income for the farmer. The trees begin to set fruits when they are about 6 years old. The fruits fall to the ground when they are mature, and can be collected from the ground. Collection directly from the tree is also possible; the fruits are collected when the colour changes to a greenish grey. A tree of 15 to 20 years can produce 400-600 fruits per harvest. To protect the fruits from direct sunlight the harvested fruits are packed in ventilating bags. At the processing site the fruits are soaked in water and macerated in order to remove the pulp, which is used for different purposes such as the production of colorants. The extracted seeds are spread out and left to dry in the shade.



1.1 Common and traditional use of the species

Traditionally, many parts of the tree are converted into colourants, syrups, pharmaceutical ingredients, tanning extracts and other materials as shown in the Table 1-1. These uses remain common practice in large areas, more remote areas of Latin America. For example, the flowers are used to produce aromatic oils and as a medicinal infusion. Wood is used as fire wood, for construction and in furniture manufacturing. The bark is used for tanning. The bark, resin and fruits are also attributed medicinal properties. However, the species is mainly grown for its fruit. *Genipa americana* is a natural source of iron, riboflavin, and anti-bacterial substances. The fruits are edible when green, and the pulp of mature fruits is used to prepare syrup, as a source of beverages and spirits. As an edible fruit it is rated low. Indigenous populations also use the pulp as an insect repellent and ethno medicine.

<u>Food values per every 100 grams of edible pulp:</u>	
Calories	113
Humidity	67.6 g
Proteins	5.2 g
Lipids	0.3 g
Glycerin	25.7 g
Fiber	9.4 g
Ashes	1.2 g
Calcium	40.0 mg
Phosphorous	58.0 mg
Iron	3.6 mg
Vitamin B	0.04 mg
Vitamin B2	0.04 mg
Niacin	0.50 mg
Ascorbic Acid	33.0 mg
<u>Aminoacids (per g de nitrogen [N 6.25])</u>	
Lysine	316 mg
Methionine	178 mg
Threonine	219 mg
Tryptofane	57 mg

Source: University of Antioquia, Colombia

Research results further indicate that the principal biochemical compounds of *Genipa americana* are: manitol, genipina, tannins, tannic, tartaric, genopocidic, catherine, hydantoine, manitol, caffeine, and calcium. *Genipa americana* contains an irrioid of genipine which reacts with proteins to produce the blue colour. It also contains two antibiotic compounds (cyclopentoid monoterpenes).

1.2 Product definition: blue and black colorants of *Genipa americana*

The focus of this market brief is the use of *Genipa americana* as an origin of blue and black colorants. In pre-Colombian times dark blue body paint was made from the green fruits of *Genipa americana*. This colorant is still used as a natural dye for colouring clothes and pottery. In remote areas of the Amazon Basin it is still used as dark blue and black body paint. This was a very common use and probably the reason for the wide distribution of the species.

The underlying market brief is on the use of blue and black colorants of *Genipa americana* in the food and cosmetics industries.

1.3 Customs/statistical product classification

On January 1st, 1988, a unified coding system was introduced to harmonise the trading classification systems used world-wide. This system is called the Harmonised Commodity Description System (HS) and was developed by the World Customs Organisation (WCO). The system comprises about 5,000 commodity groups; each identified by a six-digit code, arranged in a legal and logical structure and is supported by well-defined rules to achieve uniform classification. More than 179 countries and economies use the system as a basis for their Customs tariffs and for the collection of international trade statistics. After the six-digit code, countries are free to use further subheadings. The trade data of Eurostat uses an eight-digit system. Most codes, however, end with two zeros, i.e. effectively only using 6 digits. In some countries, even 10 digits are sometimes used.

This market brief is on the specific use of the fruits of *Genipa americana* as a provider of blue and black colorants (in liquid) for cosmetics and food products. The box below presents the HS-codes for this product and other products derived from different parts of *Genipa americana*.

Table 1-1 HS codes for products derived from *Genipa americana*

Product	Description	HS Code
Fruit		
Colourant	colouring matter of vegetable or animal origin	320300
Syrup	Sugars nesoi, incl chem pure lactose etc, caramel	1702
Food	other fruit and nuts	081290
Beverage	other non-alcoholic beverages	220290
Spirits	other ethyl alcohol (strength of less than 80 degrees), liqueurs	220890
Bark		
Pharmaceutical ingredient	Plants and parts of plants used in perfumery, pharmacy or for insecticide, fungicide or similar purposes, fresh or dried, whether or not cut, crushed or powdered	1211
Tanning Extract	other vegetable tanning extracts; tannins and their salts, ethers, esters	320190
	Vegetable raw materials used in dyeing or tanning	140410
Resin		
Pharmaceutical ingredient	Plants and parts of plants used in perfumery, pharmacy or for insecticide, fungicide or similar purposes, fresh or dried, whether or not cut, crushed or powdered	1211
Flowers		
Essential oils	essential oils, whether or not terpenes	3301

2 Market characteristics

Natural colours, like blue and black colorants of *Genipa americana* compete directly with their synthetic counterparts. Replacement happens where possible and economically feasible. However, in general, there are certain technical barriers preventing this conversion from reaching completion.

- Natural colours tend to be more expensive than synthetic ones.
- The range of shades which can be obtained with natural colours is more restricted than those which can be obtained with synthetic colours.
- The shades of natural colours are generally less brilliant.
- The colouring power of commercially available natural colours is generally less than that of synthetic colours. In general, required dosages of natural colours vary from 1.5 to 100 times more than dosages of synthetic colours.
- Natural colours are less stable during processing than synthetic colours. With some colorants, the colour begins to fade after a while.

However, a decreasing number of people is willing to eat or drink foodstuffs and use cosmetic products, which are coloured synthetically, resulting in steady growth of the market for natural colorants.

Internationally, natural colours such as blue and black colorants of *Genipa americana* are used by both the food, the cosmetics and the textile industry. Products already on the market include *Gardenia jasminoides*, a yellow colorant that can be transformed in a blue colorant. Indigo (or anil in El Salvador) is the most prominent blue colorant on the market. A prominent black colorant is logwood, which is mainly used as dye for textiles. However, applications as colorant for pharmaceuticals, cosmetics and food products are also possible. More information on these products is provided in section 4.

Detailed market information on these substitutes, and on blue and black colorants in general, is not available, as the market for colorants is specialised and extremely closed. Obtaining information from European companies can be difficult as some are not very keen on providing information. Therefore, the market brief will be focussed on natural colorants in general and on the markets in which they are used. Where possible more specific information will be included. The market characteristics for the cosmetics and food industries will be described below, as this market brief is on the specific use of *Genipa americana* as a provider of blue and black colorants for cosmetics and food products.

In general, safety requirements for both sectors are very strict in Europe. Therefore, the possible application of *Genipa americana* in foodstuffs and cosmetics depends on technical data provided. Information available so far is not sufficient to assess if the product can be safely used in the European food and cosmetics industry. Although there is interest in colorants of *Genipa americana* among interviewed buyers in Europe, these sources could not be certain of the interest in *Genipa americana* from the food and cosmetics industries. However, some industry sources did indicate that there is potential for new natural blue colorants. The demand for natural black colorants is expected to be less.

2.1 The Food Industry

A segmentation of the food ingredients market can be made according to major end users:

- Beverage industry. The beverage industry is a major user of colours.
- Ready-meals industry. The ready-meals industry is a significant end-user of ingredients (dried vegetables, processed fruit products [tomato puree], spices and herbs, natural gums, oils and fats).

- Soup industry. The soup industry is the largest end-user of dried vegetables. Preserved mushrooms are also used by this industry. The main products are packet soups (dried) including soup bases, instant soups (dried), canned soups and, to some extent, frozen soups.
- Breakfast cereal industry. The breakfast cereal industry uses nuts and dried fruits in its production of cereals, and muesli.
- Other food industries. Several other food industries utilise ingredients in one way or another. These include the pet food, confectionery (candy and cereal bars), bakery and baby food industries.

2.1.1 Organic food ingredients

The market for organic food products is comparatively small, but the sector has shown a strong growth. The sector can offer interesting market opportunities for developing countries exporters. Because of its nature, organic production is highly suitable for small and medium-sized farmers working in areas, which may not be suitable for large-scale food production. Markets with the largest penetration of organic food are Denmark, Austria, Sweden and the United Kingdom of which the latter two are the major growth markets, with annual growth rates varying between 10 and 15 percent.

2.1.2 The market for food colorants

Natural food colours have many different applications. The main product sectors, in order of importance are:

- dairy
- savoury/bakery
- soft drinks
- confectionery
- beverages

The European food colour industry is largely in the hands of multinational corporations, which often have better technological knowledge of production, greater volumes of production, more modern equipment, etc. Therefore, opportunities for exporters in developing countries of natural colours lie mostly in the supply of raw or semi-processed materials. The end-industries show less interest in blue and black colorants of *Genipa americana*, at least in directly importing colorants of this origin.

Another reason why European manufacturers prefer importing raw or semi-processed materials is that in this way they can supply their clients with a tailor-made compound. An important aim for the local producers should be to produce semi-processed colours for European manufacturers that, with their know-how of the market and products, can better fulfil the special and changing needs of the European food and cosmetics end-industry.

2.2 The cosmetic Industry

Apart from the food industry, natural colorants, including blue and black colorants, are also used in the cosmetics industry. The market for cosmetic ingredients can be divided into two main segments, the processing industry and the end-product manufacturers. The processing industry buys raw materials and processes them before selling them to the end-product manufacturers. End-product manufacturers, like the personal care industry, produce the final products as they are found in the consumer market.

2.2.1 Processing industry

- Herbal extraction houses (extraction, evaporation, juicing, distillation, fermentation, purification, drying, blending, granulation, grinding)
- Milling operation (cutting, sifting, powdering, blending, packing)
- Essential oil distillers (associated with a herb farm or mobile distillation units)

- Farms (cultivation, drying, milling, sieving, density adjustment, distillation, extraction, juicing)
- Nut and seed oil producers (cold pressing, expeller pressing, CO₂ super critical extraction, de-fatting, etherification, hydrogenation, refining, transisomerisation)
- Wholesale distributors with value-add capabilities (blending, milling, sieving, density adjustment, formulation, granulation, particle engineering, grinding, contract manufacturing)

2.2.2 *End-product manufacturers*

1. *Natural cosmetic and cosmeceutical*

- Bath products
- Aromatherapy bath products
- Bath milks and oils
- Herbal baths (sacs, salts (with essential oils) or effervescent tablets)
- Shower and bath gels
- Soaps

2. *Beauty and personal care product manufacturers*

- Decorative (eye and facial makeup, nail polishes, lipsticks, tattoos)
- Deodorants
- Oral care (chewing sticks with essential oil, dental floss with essential oil, mouthwashes, herbal tooth gel and toothpaste)
- Skin care (skin conditioners, gels, lotions and creams, masks, massage oils, moisturizers, toners)
- Shaving products (shaving cream, after-shave lotion)
- Suntan and sunscreen products

3. *Hair care product manufacturers*

- Hair colouring products
- Hair growth products
- Herbal shampoos, conditioners, oils, rinses
- Styling gels

4. *Perfume and fragrance product manufacturers*

5. *Wound healing, injury, pain relief drug, cosmetic product manufacturers*

- Herbal balms, distillates, gels, liniments, ointments, plasters, salves

The market is also segmented according to type of ingredient such as essential oils, vegetable oils and plant extracts. There are buyers who are only interested in one type of ingredient, while others are active in the whole range of ingredients. Many EU importers have an Internet site, where interested parties can find more information on the field in which these importers are active.

2.3 **Import and export of natural colouring matter**

2.3.1 *Imports*

European import data specifically on natural blue and black colorants (of *Genipa americana*), or on the substitutes of *Genipa americana* are not available. However, Chr. Hansen, one of the leading food ingredient manufacturers, estimates the European market for natural colours as a whole in 2001 at € 393 million. This is about a third of the total global colour market of € 1.1 billion.

The market for natural food colours has been steadily growing over recent years. Consumers look for foodstuffs with a fresh and appealing colour. In addition, a decreasing number of people are willing to eat or drink foodstuffs, which are coloured synthetically.

More specifically, the subject colorant, blue and black colorants of *Genipa americana*, can be placed under colouring matter from vegetable and animal sources. Eurostat provides import and export data for this group for the EU-15 market.

From 2001, imports of natural colouring matter from vegetable and animal sources by EU member countries remained fairly stable in value, amounting to € 168 million in 2003. However, according to the Eurostat data, imports in terms of volume increased with 10 percent 23 thousand tonnes in 2003. Germany, the leading EU importer of colouring matter from vegetable and animal sources, accounted for 18 percent of the import value in 2003. The other leading importers were the France (14%), Spain (13%), the UK (13%) and Italy (10%). In 2003, 41% of the total import value of natural colouring matter was supplied by countries outside the EU and 25% from developing countries. However, local production does not only come on account of local producers, but also of multinational European companies. These companies produce natural colours on the spot in developing countries.

The leading development countries providing these products to the EU are Peru (33 % of total EU-imports from developing countries), China (19%), India (16%), Mexico (9%) and South Africa (5%).

Table 2-1 Imports of colouring matter from vegetable and animal sources

	2001		2002		2003	
	value	volume	value	volume	value	volume
Total	173,762	20,938	173,857	22,755	168,251	23,163
Extra-EU	74,516	7,675	65,684	6,956	68,168	7,757
Germany	35,522	3,888	40,654	4,160	30,380	3,574
France	18,576	1,752	17,992	1,636	23,393	2,255
Spain	28,137	2,866	18,561	2,485	21,855	2,826
United Kingdom	20,069	2,568	20,131	2,929	21,528	3,638
Italy	14,341	2,838	15,876	3,390	16,974	4,124
Denmark	17,909	1,906	15,290	1,861	15,084	2,259
Belgium	7,785	715	8,965	937	12,123	1,293
The Netherlands	10,834	932	15,277	1,092	10,959	886
Ireland	6,458	392	7,669	397	3,656	231
Austria	4,458	724	3,851	655	3,361	745
Sweden	3,772	1,091	3,878	343	3,320	282
Portugal	3,010	575	3,000	594	2,449	649
Greece	1,467	523	1,425	2,146	1,589	251
Finland	1,292	160	1,278	131	1,516	149

Source: Eurostat 2004

As mentioned above, about 45% of the total imported value was supplied by countries outside the EU, mostly represented by developing countries. Therefore, natural colours provide opportunities for exporters in developing countries. This is particularly the case for indigo, which is one of the most ancient blue dyestuffs used for textiles, but is also used in the cosmetic industry. The leading supplier is India, but there are some other (small) suppliers (e.g. El Salvador). Other interesting natural colours include cochineal, carmine, curcuma/turmeric, marigold and henna (these are included in Alban Muller's list of ingredients). Marigold is mentioned by ten Kate & Laird (1999) as a product containing compounds of interest to product development teams.

2.3.2 Exports

Exports by EU member countries of colouring matter of vegetable or animal origin increased slightly in value, amounting to € 205 million in 2003. In volume a 33 percent increase was reported, to 92

thousand tonnes. The leading EU exporter was Spain, accounting for 23 percent of EU-exports (in value), followed by Germany (15%), Denmark (13%), The Netherlands (11%) and France (10%). The major destinations were Germany, the USA, France, Japan, the UK and The Netherlands which together received almost half of exports by EU member countries in 2003.

3 Consumption patterns and trends

3.1 Cosmetics industry

General

No specific figures are available concerning the industrial demand for natural ingredients such as colorants in the EU cosmetic industry. The production figures of the EU companies manufacturing the end-product can, however, be used to give an indication of the consumption of ingredients in the EU.

According to a recent study by Euromonitor, the global market for cosmetics and toiletries in 2002 was valued at € 201 billion, indicating an increase of 4.8% compared to 2001. Western Europe represents a massive share of over 31% of the global cosmetics and toiletries market. Spain, Portugal and Ireland were the most dynamic countries in the period reviewed. North America takes a close second place, with almost 25% of total global sales and saw the slowest growth in 2002. At 23% the Asia Pacific regional share comes in third. Latin America sits in fourth place with a 9.3% global share and experienced the fastest growth, thanks to the stabilisation of some key economies. The rest of the world represents 12% of the global market. Eastern Europe is one of the fastest growing markets, with rising levels of disposable income among consumers.

In 2003, the West European market for cosmetic and toiletry products continued its upward momentum. The growth rate of 3.5% corresponding to € 58.10 billion retail sales prices was recorded as being slower than the 4.8% in 2000, but almost equivalent to the 3.6% of 2002. However, the increase in the cosmetics market in 2003 was higher than the growth rate of the gross domestic product for Western Europe (1%).

The EU is not just an important consumer of cosmetic products, the EU is also the world's largest producer of cosmetic products, with the USA and Japan following at a distance. The main EU producers are multinational companies like Unilever (The Netherlands/UK), L'Oreal (France), Wella (Germany), Sanofi (France), and Beiersdorf (Germany). Many of them operate across a wide spectrum, being involved in other sectors such as pharmaceuticals, chemicals, food or household products.

The principal market drivers were: growing consumer concerns about health, a sense of well-being and looking good. Men's grooming products were a particular beneficiary of this trend. Older consumers were also mentioned as a core target group, many of who are increasingly affluent and keen to spend more on maintaining a youthful appearance. Other trends include interest in "natural", spa-at-home and detox products as people look for ways to feel good about themselves and escape from the stresses of everyday living.

3.1.1 Important trends: Natural cosmetic products and cosmeceuticals

An important trend within the cosmetic sector is increasing consumer sophistication and interest in all things natural. Consumers are calling, across sectors, for healthier and more natural products. Increased consumer sophistication and awareness of ingredients, performance and health benefits are changing the personal care and cosmetics industry. The trend is veering away from products that

Table 3-1 World's Top-20 Beauty Companies, 2003

Company	revenues (€ billion)
1. L'Oreal	9.9
2. Procter and Gamble	7.5
3. Unilever	5.0
4. Shiseido	3.6
5. Estee Lauder Cos.	3.5
6. Avon Products	2.9
7. Johnson & Johnson	2.7
8. Beiersdorf	2.4
9. Wella	2.3
10. Alberto Culver	1.9
11. Kao Corporation	1.8
12. Limited Brands	1.7
13. Kanebo	1.7
14. Colgate-Palmolive	1.7
15. LVMH	1.5
16. Henkel	1.4
17. Boots	1.4
18. Coty	1.3
19. Revlon	1.1
20. Mary Kay Inc.	1.1

Source: WWD Beauty 100 (2003)

superficially enhance beauty but have no biological effect, to ‘therapeutic’ products so-called cosmeceuticals that might, for example, repair damaged tissues, smooth, protect from the sun, and moisturise. This has led to increased use of new, active ingredients, including natural products with defined constituents and specific biological effect.

Natural personal-care products accounted for € 2.1 billion in the 1997 global personal-care market. More recent figures are not available, but it is clear that since then this market has grown rapidly, by an estimated average annual growth of 8-25%. In contrast, the mainstream, largely synthetic or petrochemical ingredient-based market segment of this industry on average increases by 3-10%.

The number of small and large companies entering the market of natural products is on the rise, and during the last few years, there has been a massive entry into this arena by the large mainstream manufacturers. Growth in the natural personal care and cosmetics market is global. For example, in South East Asia, several local manufacturers have successfully introduced new products with plant extracts like cucumber, apricot, ginseng, iris, and aloe, and are marketing brands in competition with overseas companies like the Body Shop.

3.2 Food industry

General

The food and drink industry is of paramount importance for the economy of the European Union, since it uses huge amounts of food ingredients. The total EU output of the food and drink industry in the EU witnessed a total increase of 15% as from 1998, reaching € 626 billion in 2001. The so-called ‘various food products,’ the meat industry, the beverage industry and the dairy industry are the four main food and drink sectors. France is the biggest producer of the first two while Germany and the United Kingdom respectively dominate the other two. Bakery, pastry, chocolate and confectionery products represent more than half the production value in the ‘other foodstuffs’ category.

Germany is the largest consumer of natural colours in Europe, followed by the United Kingdom and France. Approximately one fourth of total food colours sold in the world are of natural origin.

Globalisation has been a clear trend in the food industry in the decade and the average size of producers has been increasing. The multinational giants do business with a limited number of food ingredient suppliers, who are expected to provide not only a physical colouring product but also tailor-made solutions including ideas and services.

3.2.1 Important trends: Health and organic food

- Health food: European consumers have a strongly increased interest in a healthy life-style and, consequently, in the consumption of health food. Health food refers to food products, which are low in fat and have limited sugar and salt content; this includes functional foods, which have specific health-promoting properties and food products with added vitamins and minerals or bacteria supporting the intestinal function.
- Organic food: Since European consumers have recently experienced several food scares; many people are concerned about the safety of food, as well as the effects of intensive farming on the countryside and on the environment in general. These factors, combined with the increasing

Sector	1998	2001	+/-
Various food products ¹	134	163	+22%
Processed meat	102	126	+24%
Beverages	93	98	+5%
Dairy products	88	96	+9%
Animal feed	35	40	+14%
Processed fruit & vegetables	32	36	+13%
Flour & starch products	20	27	+35%
Oils & fats	29	25	-14%
Fish products	12	15	+25%
Total EU	545	626	+15%

¹Including bakery, pastry, chocolate, confectionery products, which together account for more than half of the production of this category.

Source: CIAA (2003)

awareness of the importance of diet and nutrition, have intensified interest in organic foods, which are grown according to principles laid down in Directive EC 2092/91

3.2.2 Natural colorants

The market for natural food colours has been steadily growing over recent years. However, the expectation that a large proportion of synthetic colours would gradually be replaced by natural colours has proved too optimistic. Even though many consumers state a preference for naturally coloured food the attractiveness of synthetically coloured products does appeal too many. In comparison natural colours are usually less bright. Still, while consumers look for foodstuffs with a fresh and appealing colour, a decreasing number of people are willing to eat or drink foodstuffs, which are coloured synthetically.

Because of this situation, there is a clear tendency towards more genuine natural food colours. Manufacturers of genuine natural food colours only use edible fruits, vegetables and plants as basic raw materials and they try to utilise manufacturing processes that are as close to nature as technically possible. Traditional raw materials used for producing natural food colours are blue grapes, elderberries, hibiscus fruits or red cabbage. Some natural food colours are being manufactured in part from substances of natural origin, which would normally not be eaten. Annatto, for example, is an extract from the seeds of the *Bixa orellana L.* bush. These seeds, however, are not edible and the colour is extracted with organic solvents. Carmine is an extract obtained from the cochineal insect, precipitated with aluminium salts.

Prices for natural food colours have become more stable in recent years. However, they are still more expensive than synthetic ones. In view of the favourable development of prices and the trend towards natural products, that the market share for natural foods colorants will increase. However, stability of natural colours and the durability of colour brilliancy is less than that of synthetic colours, especially black colorants. On the other hand, synthetic black colorants are considered poisonous. Many natural colorants begin to fade after a certain period, around half a year. Moreover, certain production processes such as heating negatively influence the as these products do not maintain their colour above a certain temperature. Therefore, more stable and durable natural colours offer possibilities in both the food and cosmetic market.

4 Production

4.1 Production of natural colorants

Colours are generally divided in synthetic and natural colorants such as blue and black colorants of *Genipa americana*. Synthetic colours are colorants which do not occur in nature and are produced by chemical synthesis. Sometimes the term nature-identical colour is also used. Nature-identical colours are manufactured by chemical synthesis, so as to be chemically identical to colours found in nature. One should not be concerned about possible adverse health effects caused by eating synthetic food colours. All the synthetic food colours have been exhaustively tested and the results have led the World Health Organisation (WHO) to confirm their listing as permitted food colours.

Natural colours can be divided in two categories. Firstly, natural colours can be derived from natural foods. Secondly there are also natural colours that are derived by various processes from natural sources that are not normally consumed as food. The colours are derived from natural vegetable or animal sources using recognised methods. These are:

- Extraction with water;
- Extraction with organic solvents and subsequent elimination of the solvent by evaporation;
- Supercritical extraction with carbon dioxide.

Only a few of the colorants and dyestuffs encountered in nature are commercially exploitable. EU trade data show that France and Germany are the leading suppliers to the EU market. However, in the FAO publication *Natural colorants and dyestuffs*, which includes an overview of major colorants and dyestuffs entering international trade, no significant production in European countries is reported, except for paprika from Spain and Hungary. Paprika is actually not a colorant itself, but a starting material for the production of colorants. This colorant is mainly used in food products.

The European Union has no substantial domestic production of raw material for natural food colours. A couple of large manufacturers in Europe are responsible for the production of food colours for the food industry, natural as well as nature-identical and artificial colours. Their products are finished products, which can be used directly in food products, and semi-processed products to sell to other end-producers.

Colours are sold in different forms:

- *Powder*: a dried substance on a neutral carrier. It has a high percentage of colour substance. This is the most common form of dye found in the marketplace. It is easy to dissolve in food products. However, it can expose handlers' dust and cause cross-contamination between product lines.
- *Blended powders*: the advantage of a blended powder is that it negates the need for operatives to charge individual primary colours.
- *Solutions* in water, oil, alcohol or other permitted organic solvents.
- *Emulsions*: ground suspensions of a pigment in a carrier in which the pigment is not soluble. The emulsion is already dispersible in aqueous systems, has improved stability to oxidation, pH, heat and light, and is suitable for use in many different applications.
- *Granulars*: granulated dye blends provide a controlled product in a dust-free formulation.

Below three different important natural colorants will be discussed; indigo and *Gardenia jasminoides* in reference to blue colorants and logwood in reference to black colorants of *Genipa americana*. Figures on the size of production and their use relative to synthetic and other natural colorants are not available.

Blue: Indigoid colorants

The most prominent natural blue colorant is indigo. This colorant is mainly used as a textile dye but also has applications in the cosmetic and food industries. The decline of natural dyes in the textile sector, caused by the introduction of industrial dyes with low toxic levels, makes these markets especially important for indigo producers as the market for natural colorants for cosmetics and food is expected to grow. Indigo grows all over the world in a variety of physiographical settings. Since it can be intercropped and it enriches the soil it is considered a sustainable commercial crop. Established commercial indigo fields exist in Southern Mexico and Southern India with experimental fields in other part of India, the US and Europe.

The two species containing the greatest amount of the active colorant are *Indigofera tinctoria*, and *Indigofera suffruticosa*. For the production of a variety of blue colorants the leaves are used. An unusually small molecule produces this stable blue colour in a vat process. Indigo requires a simultaneous process of solubilization accompanied with reduction to achieve the blue colour. Other naturally occurring indigoids are the shellfish dyes: purpura and murex (Fintrac, 2003).

Blue: *Gardenia jasminoides*

Gardenia jasminoides or Cape jasmine is an evergreen shrub that originates from southern China and Japan. It is now widely cultivated in the tropics and sub-tropics, particularly in Southeast Asia both as a garden ornamental and as a source of a yellow food colorant. In recent years, usage of the extract has developed in the processed food industries in Western Europe as a less expensive colorant substitute for saffron in applications where the latter's flavour is not required. Fruits of *Gardenia jasminoides* also contain the main component of *Genipa americana*, genipin. This can be transformed to blue pigments by a simple modification. The blue pigments of this extract remain stable after 10 h at temperatures of 60-90 degrees °C. Colorants of *Genipa americana* maintain their colour up to a higher temperature, which could form an advantage in comparison to *Gardenia jasminoides*.

Black: Logwood (*Benzophyrone*s)

A prominent natural black colorant is logwood or benzophyrone. These are extracted from the heartwood of *Haematoxylon campechianum* or logwood. The active colorant substance is principally haematein. Logwood requires oxidation to achieve darkest, black shades. It is also mainly used as dye for textiles. However, it can also be applied as colorant for pharmaceuticals, cosmetics and food products.

Logwood is a tree indigenous to the tropical regions of Mexico and Central America. It is a historical dye that is exported all over the world, mainly from Jamaica, Haiti and the Dominican Republic. Currently it is harvested from forests in Honduras & Mexico. Reforestation programs are underway to ensure its sustainability (FAO, 1995).

4.2 Production and processing of blue and black colorants of *Genipa americana*

Provision of the fruits is conducted by local communities both from the wild as from plantations. In the Amazon region there are a large number of natural sources of *Genipa americana*.

At the processing site, the fruits are soaked in water and macerated in order to remove the pulp, which is used for the production of colorants. For the production of colorants harvested fruits are peeled, and the pulp and seeds are extracted using a mixture of water and ethanol as solvent. The extracted seeds are spread out and left to dry in the shade. The extracted colour is concentrated through evaporation or through the recovery of the solvent. The dark blue and black natural colours maintain their colour up to a temperature of 149 °C. This is good for a natural colorant and high compared to *Gardenia jasminoides*, for example. Importers saw this as a clear advantage. Blue colorant is already stabilised. Black colorants are not stabilised and are often marketed as a paste. The greatest challenge is going to be to process the colorant in a powder form.

5 Trade Structure

The market for colorants is specialised and extremely closed. Obtaining information from European companies can be difficult as some are not very keen on providing information. The bulk of the trade in colorants, pigments and dyes is controlled by big multinational companies. Other exporters usually operate through an importer or an agent to promote their products on foreign markets. An importer is generally used if a product needs to be further processed, to achieve an industrial standard.

The selection of a trade partner depends on the product and on the services delivered by the trade partner. It is important that the exporter is aware of the different channels in the market. The figure below gives an indication of the distribution channel for natural colorants and the food ingredients sector in general. Typically the main parties involved in the market for natural colours such as blue and black colorants of *Genipa americana*, except for exporters themselves are:

Brokers/agents

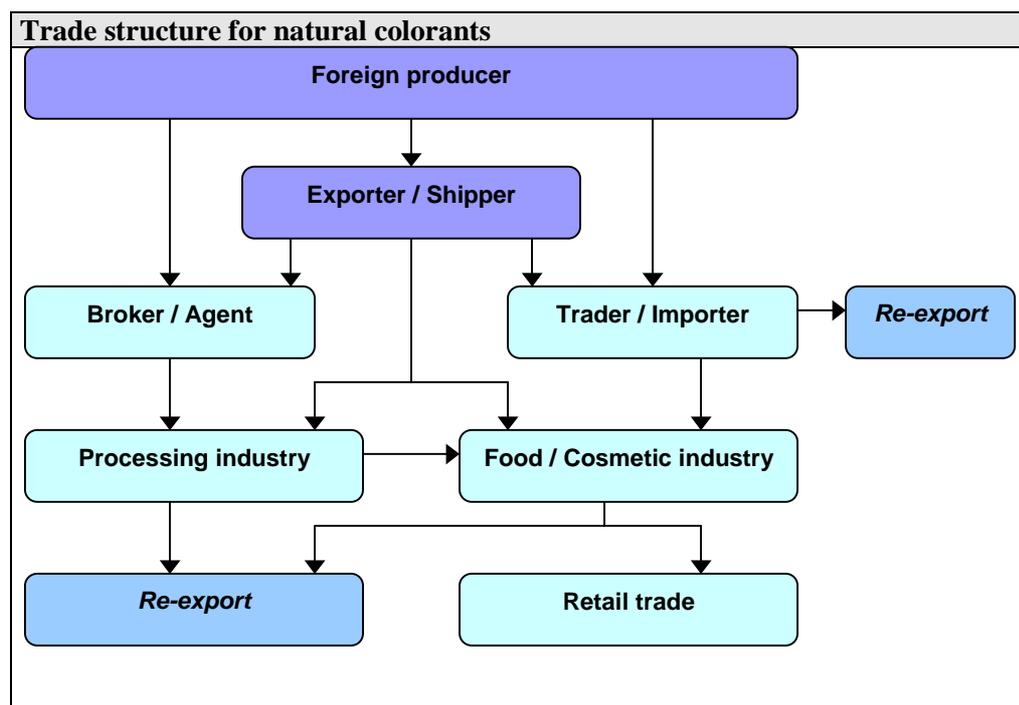
Agents are independent companies who negotiate and settle business on the instructions of their principals and act as intermediary between buyer and seller. They do not take title of products. For their services they are paid a commission. The customer can be a trading company or the industry. Brokers usually have a broad view on market trends, prices, users, etc.

Trader/importer

Traders buy their products from exporters in the developing countries and sell to processors of crude or end products or to other trading houses. The traders are usually highly specialised in the colour market and they play a vital role in the trade of colorants. This specialisation is very important because the trade in colours involves many risks. Moreover, in the conservative pigments and dyes market (in particular with respect to products from developing countries), the name of the importer often serves as a quality label for the product. It is also essential to maintain contacts with the exporters in the developing countries. Therefore, the involvement of an importer or an agent is mostly indispensable for gaining access to the market.

Processors of crude and refined products

Processors produce colorants as ingredients for making a wide variety of end products in the grocery, compound feed and industrial sectors. Some of the more important food colour manufacturers worldwide are Chr. Hansen (Denmark), Warner Jenkinson (USA), Sankei (Japan), Arômes de Bretagne (France), Kalsec (USA) and Quest (NL). These also provide colours to other sectors as well such as the cosmetic and pharmaceutical industry. Apart from processing these companies are also actively involved in trading.



The margins for the different intermediaries in the trade structure (importers, agents, etc.) are difficult to determine. This is caused by the fluctuating prices of the colours and, again, the closed market. A rough estimation shows that the margin for the importer varies from 3 to 5 percent. The brokers typically get the same margin. When producers deliver directly, they can obtain a higher margin.

The site www.ingridnet.com is a marketing instrument for companies supplying ingredients. The database includes contact details of 10,000 ingredient suppliers and is used by the food, cosmetic and pharmaceutical industries to source ingredients.

Developing-country exporters of organically grown products can get themselves listed as suppliers on websites like www.green-tradenet.de and www.greentrade.net. These are websites where suppliers and buyers of organic products come together. Suppliers can specify their offer and company name.

Most EU importers have a website, where interested parties can find more information on the field in which these importers are active. Besides websites of respective companies, the cosmetic suppliers' guide (www.cosmeticsbusiness.com) and Europages (www.europages.com) are other good sources for finding contact details and information on the activities of importers.

6 Market Access

When exporting blue and black colorants of *Genipa americana* to the European Union, exporters will have to comply to different requirements. These have been laid down either by governments or by the industry itself. It is very important that legislative requirements (i.e. product legislation) in the EU are taken into account. As blue and black colorants of *Genipa americana* is both used in the cosmetic and food industry, specific requirements of those two industries are discussed.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is relevant for both industries. This convention bans commercial international trade in an agreed list of endangered plants and by regulates and monitors trade in others, which might become endangered. For the 230 included plants commercial trade is permissible, provided specimens of listed species are legally harvested without detriment to wild populations, and valid CITES documentation is obtained prior to shipping. ☞ *Genipa americana* is not included in this listing. For up-to-date information on species included in CITES, please refer to: <http://www.cites.org>

One advantage that producers in developing countries have is that many of the new ingredients that companies are looking for, could originate in those parts of the world where there is a tradition of using natural ingredients for skin, hair care and food products. Paradoxically, the difficulty facing ingredients such as blue and black colorants of *Genipa americana* is that they are unknown in Europe and therefore companies will be reluctant to use such ingredients without detailed safety assessments. One approach here is to develop mutually beneficial relationships with companies dealing in natural ingredients that may be able to support and guide the supplying company through the legislative requirements.

6.1 Legal requirements

REACH

Under REACH, which is now under consideration by the EU Parliament and Council, enterprises that manufacture or import more than one tonne of a chemical substance per year would be required to register it in a central database. REACH would furthermore give greater responsibility to industry, to manage the risks from chemicals and to provide users in the supply chain with safety information on the substances. During the period of consideration from 2004 until implementation in 2006, different preparatory actions will take place to allow for immediate implementation when it enters into force. REACH has influence on the desirability of introducing new ingredients for cosmetics and food industries as they have greater responsibility for the entire supply chain. Based on the combined nomenclature product classification (HS-chapter 32) '*Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics and inks*' natural colorants are among the product categories covered by REACH.

For exporters of blue and black colorants of *Genipa americana*, it is important to stay well informed on developments concerning REACH. To obtain up to information, please refer to <http://europa.eu.int/comm/enterprise/reach/index.htm> or <http://ecb.jrc.it/> (European Chemicals Bureau).

6.1.1 Cosmetics Industry

EU product legislation on environmental and consumer health and safety issues is of utmost importance. The standards to which cosmetic ingredients have to comply are generally very high. They are characterised by Technical Data Sheet (TDS, also for the food industry), Material Safety Data Sheet (MSDS) and by the requirements for INCI, EINECS (European Inventory of Existing Commercial Substances, listing all existing substances on the EU market) or ELINCS (European List of Notified Chemical Substances). The latter two are also of relevance for the food industry.

Substances entering commerce in the European Economic Community (EEC) that are not on EINECS or INCI will require registration through ELINCS in accordance with Directive 91/155 of the EEC. Cosmetic ingredients have to comply with several legal EU requirements on safety, marketing and Good Manufacturing Practices.

Cosmetics Directive 76/768/EEC

The leading legislation determining access to the EU is laid down in Directive 76/768/EEC. The Cosmetic Directive indicates:

- which substances are not allowed in cosmetic products;
- which substances are allowed in cosmetic products up to pre-specified limits and conditions;
- which colorants are exclusively allowed in certain applications in cosmetics;
- which preservatives are exclusively allowed in cosmetics.

Since 1997, cosmetic manufacturers have been under the obligation to hold product information dossiers for all their products, containing the following information:

- the qualitative and quantitative composition of the product;
- the physico-chemical and micro-biological specifications of the raw materials and the finished product, and the purity and microbiological criteria of the cosmetic product;
- the method of manufacture, which must comply with the Good Manufacturing Practices (GMP);
- an assessment of the safety for human health of the finished product; to that end, the manufacturer shall take into consideration the general toxicological profile of the ingredient, its chemical structure and its level of exposure;
- the name and address of the qualified person(s) responsible for the safety assessment;
- existing data on undesirable effects on human health resulting from the use of the cosmetic product;
- proof of the effect claimed for the cosmetic product, where justified by the nature of the effect or of the product.

Directive System of Information for Dangerous Substances 91/155/EEC

Directives 67/548/EEC and 99/45/EC requires producers of dangerous chemicals to provide industrial and professional users with detailed health, safety and environmental information and advice about their products in the form of (material) safety data sheets. Directive 91/155/EEC, as amended by Directives 93/112/EEC and Directive 2001/58/EC, sets out the requirements for the information that should be included in a safety data sheet. The main purpose of safety data sheets is to enable employers to determine whether any hazardous chemicals are present in the workplace, and to assess whether there is any risk to the health and safety of workers and/or to the environment arising from their use. Directive 98/24/EC (which is the responsibility of DG Employment) sets out employers' responsibilities in detail.

INCI

As blue and black colorants of *Genipa americana* is also used as a cosmetic ingredient, it is interesting to look at the International Nomenclature Cosmetic Ingredients (INCI), which refers to the common nomenclature for labelling ingredients on the packaging of cosmetic ingredients, which is used by the European Cosmetic Toiletry and Perfumery Association (Colipa).

An INCI name may covers several chemical entities. Assignment of an INCI Name is for cosmetic product ingredient identification purposes only, and does not indicate that the ingredient is safe for any particular use and neither that the use of the substance as a cosmetic ingredient complies with the laws and regulations governing such use in the United States of America or any other country (CTFA, 2004). Before exporting you ingredient, it is important to register it under an INCI name.

Blue and black colorants of *Genipa americana* is not yet listed in the INCI inventory. In the case of novel ingredients, which are not regulated under the Cosmetics Directive, the responsibility for the safety of the resulting product lies with the cosmetics manufacturer. In order to assess the safety of such ingredients and have them regulated under the Cosmetics Directive, safety files are prepared by the cosmetics industry and submitted to the Scientific Committee on Cosmetology (SCC, the advisory body of the European Commission), via The European Cosmetic Toiletry and Perfumery Association Colipa. The SCC consists of qualified persons in the different EU member states.

Once a proposal has been accepted by SCC, the European Commission publishes the modification to the Cosmetics Directive in the Official Journal of the European Communities. The member states of the European Union have to implement the modification in their national laws. It is only after publication in the Official Journal of each member state that the substance in question will be permitted to be utilised, according to the conditions laid down in the Directive.

Please refer to the following website for more detailed information:

<http://pharmacos.eudra.org/F3/home.html> (EU Cosmetics Directive)

<http://www.europa.eu.int/comm/enterprise/chemicals/legislation/sds.htm> (information on MSDS and links to other relevant sources)

For more information on Directive 91/155/EEC, please refer to:

<http://europa.eu.int/comm/enterprise/chemicals/legislation/sds.htm>

For further information about INCI or for details on how to register an ingredient on the INCI register please visit <http://pharmacos.eudra.org/F3/inci/index.htm> , <http://www.ctfa.org/> (Cosmetic, Toiletry, and Fragrance Association) or <http://www.colipa.com/> (Colipa)

For information on ELINCS, refer to: <http://ecb.jrc.it/new-chemicals/>.

6.1.2 Food Industry

Food safety is an increasingly important issue for European consumers caused by several food scandals. In order to reassure consumers and restore confidence in food products, regulation on food products and ingredients has become more stringent and increasingly complex.

General food regulation

The market access for food ingredients for industrial use is regulated through the EU basic regulation EC 1035/72, which stems from the Common Agricultural Policy to protect EU agricultural produce, producers and consumers.

In 2002, regulation EC 178/2002, also known as the General Food Law, has been adopted. The core aspects will take force in January, 2005, until then products should continue to comply with separate EU member states' legislation. It lays down the general principles and requirements of food legislation, established the European Food Safety Authority and laying down procedures in matters of food safety and the traceability of food.

Hygiene and safety

General rules for food hygiene are laid down in the Directive 93/43/EEC. Hygiene is defined as all measures to ensure safety and wholesomeness of foodstuffs. The new regulation states explicitly that foodstuffs cannot be placed on the EU market if they are unsafe. This was, at least implicitly, already regulated through national food law, but now there is an EU-wide explicit regulation.

Traceability

Due to increasing consumer attention for food safety, industry and trade in the EU are obliged to have full command and information on the whole food chain. For each step, the origin (supplier, date and batch of production) of all raw materials used should be documented. This means that exporters overseas have to be able to give their buyer full information on the origin of their product. Companies dealing with organic products are already familiar with such administrative requirements.

Organic and novel food products

EU standards for organic food production and labelling are laid down in Council Regulation (EEC) 2092/91. It establishes the main principles for organic production at farm level and the rules that must be followed for the processing, sale and import of organic products from third countries. Prospective exporters should be aware that the grower, the processing industry, as well as the exporter have to be inspected and certified by an internationally accredited certifying body.

Regulation (EC) 258/97 on Novel Foods and Novel Food Ingredients sets out rules for authorisation and labelling of GM food products and other categories of novel foods. It indicates that food products that were not on the EU market before 1997 cannot be introduced in the market before it is demonstrated that they are safe. Furthermore, the control of GMO-free product claims is expected to become stricter within the EU.

The Approved Additives regulation

The Approved Additives regulation governs the application of non-nutritive substances, which are allowed to be added to some or to all food products, to produce a certain effect, like food colorants. Furthermore, all authorised colorants have to fulfil purity criteria, which are set out in detail in the Commission Directive 99/75/EC for colours. Moreover, according to Directive 2003/89/EC, food industries in the EU are obliged to explicitly declare on the label of their product the presence of allergenic substances.

Specific regulation for natural colours in food

The section above dealt with requirements of food ingredients in general. The following will specify requirements that are relevant for natural colours such as blue and black colorants of *Genipa americana* in food. The directives that are of importance are:

- Directive covering colorants 94/36/EEC
- Directive 95/45/EC “Purity requirements for colourings”
- Directive 88/344/EC “Extraction solvents”

There are different types of natural colorants among which are the colouring plant extracts. If an extract is selectively extracted (i.e. only the specific substance is isolated) it is defined as a colorant. Such a colorant is subject to legal measures and only a limited number of natural colorants for food are currently allowed into the European Union. It is, for example, not allowed to add colorants to some foodstuffs. If the other substances from the starting material are still included in the extract it is not defined as a colorant but as a plant extract. Such extracts are not subject to the legal measures for colorants. Hence, they do not have to be labelled on the end product as colorant. In general, *Genipa americana* can be processed and marketed as colouring plant extracts or as a colorant if the specific substances are isolated.

ISO (International Organisation of Standardisation) uses standard specifications, which include a definition of the acceptable botanical source and processing method for the product, specifications for physico-chemical properties etc. A description of the colour and odour, and the analytical procedures to be used, are also part of the standard specifications. Addresses can be found in Appendix 1 of this market brief.

Information sources

Integral texts of directives and regulations mentioned in this market brief, refer to: www.europa.eu.int/eur-lex/en/search.html
http://www.europa.eu.int/comm/food/index_en.htm provides an overview of General Food Safety approach of the EU. EU pesticide residue legislation can be found at: http://europa.eu.int/comm/food/plant/protection/pesticides/index_en.htm
EU regulations on pesticides and other contaminants: www.useu.be/agri/pesticides.html

An overview of additives, as specified through E-number, with a description of their use and in which countries they can be legally used can be found on: <http://www.ukfoodguide.net>.

6.2 Quality standards

General

Quality is the sum of all aspects of a product indicating that it is “fit for use“, complying with all legal and consumer requirements: product safety, taste, colour, structure, etc. The quality of natural colours like blue and black colorants of *Genipa americana* is assessed by a buyer on the basis of a number of criteria. Of principal importance are considerations of health and safety. The requirements are:

- Colour character and intensity;
- Physical properties and chemical composition;
- General purity and appearance;
- Toxicity;
- Stability;
- Uniformity of quality;
- Processability.

Product documentation should contain detailed specification of these properties. The weight these different requirements are given is dependent on what is required by the buyer and for which purpose the product will be used. The quality of a product has to be warranted by means of a quality control system. A quality control system is primarily the responsibility of the producer himself, but also has to comply with legal requirements and with product specifications required by buyers.

The exporter has to determine for which end-use (cosmetic or food industry) he or she intends to supply. Quality standards and technical specifications vary greatly between the different industries, but standard systems important for both industries are described below.

GMP and GACP

Producers of blue and black colorants of *Genipa americana* should be prepared to apply the Good Agricultural and Collection Practice (GACP) and the Good Manufacturing Practice (GMP). These standards state minimum quality and hygiene requirements for the production process. Please be aware that Colipa (The European Cosmetic, Toiletry and Perfumery Association) sets GMP guidelines for cosmetics. As a sector association Colipa is able to influence legislation. It should also be noted that the GACP and GMP guidelines of WHO are binding for UN member states and have to be incorporated in national and regional legislation. The legal implementation of these guidelines can be found at the Internet site <http://pharmacos.eudra.org/>, which includes cosmetics as well.

ISO 9000

The ISO 9000 standards provide a framework for standardising procedures and working methods, not only with regard to quality control but also to the entire organisation. This means that quality, health, safety and environmental management programmes become strongly interwoven with the overall ISO management plan. ISO 9000 does not specifically address product safety and quality, but it is a guarantee that things are always done in the same way. One has to bear in mind that the decision to become ISO 9000 certified means a firm commitment, which will draw on the company’s human and financial resources and which unavoidably will continuously add procedures and paper work. ISO certification is not required for producers of *Genipa americana*. Nevertheless, manufacturers of natural colorants, which have obtained an ISO 9000 series certificate, possess an important asset. The certification may be a vital factor in the selection process applied by trade partners in Europe.

Cosmetics Industry

A range of bodies monitors product quality and trading procedures and draws up specifications for natural ingredients for cosmetics. The most widely recognised standards are those set by the International Organisation for Standardisation (ISO), as described above.

Next to these requirements buyers have their own criteria by which they assess the desirability of new natural colorants. Industry sources indicate that the most important requirements for the use of new products such as blue and black colorants of *Genipa americana* by the cosmetic industry are:

- User friendliness: The product should be usable for different purposes. Moreover the manner of application must be simple, as not to complicate production processes.
- Price: The price of the product must be reasonable compared to its substitutes.
- Stability: The product must retain its colour and properties under all circumstances.

Excelling in these respects will gain producers a significant advantage when contacting buyers. Next to these are other important requisites such as the colour character and intensity, the chemical specification, toxicity and a uniformity of quality.

For the cosmetic industry to consider using a new colorant, this information needs to be specified in great detail. Moreover information should be included on side-effects, such as properties affecting health or possible allergic reactions.

Food Industry

The need for good quality management takes on increasing importance in Europe. Two systems to demonstrate reliability of a quality control system are HACCP and ISO 9000. HACCP applies to the food-processing industry.

HACCP

The Hazard Analysis Critical Control Point (HACCP) system is applicable to companies that process, treat, pack, transport, distribute or trade foodstuffs. Exporters of natural colorants to the EU are not yet obliged to have an HACCP system and their system will not be subject to control by the food inspection service in the importing country. However, the fact that producers of *Genipa americana* have an approved HACCP system, or work following a similar principle of quality control, will be a very positive argument for buyers. Importers sometimes even require exporters to work with HACCP. Exporters can set up their own HACCP system, which often will be audited by their buyer, or have their system certified by an internationally accredited certifying body. *Please note that Regulation (EC) 852/2004 has been passed that will enforce the same requirements for food imported into the EU as for food produced within the EU. From January 1st 2006, exporters to the European Union will also be obliged to confirm to HACCP, and the system will become a requirement.*

Useful websites are:

- ① <http://www.who.int> (GMP and GACP)
- ① <http://www.iso.org> (ISO)
- ① <http://ecb.jrc.it/> (European Chemicals Bureau, for REACH)

6.3 Trade related environmental and social issues

Environmental aspects of products have become a major issue in Europe in recent periods, depending on the product group in question. Besides legislation, one of the instruments of the EU to promote environmentally sound products is the awarding of (tariff) preferences or the levying of environmental taxes on products. Please refer to www.europe.eu.int/comm/environment for more information. Besides governmental actions (legislation and regulation), a strong consumer movement is noticeable in most EU member countries. Eco labelling procedures are purely aimed at the products and indicate that the product with a label has a reduced impact on the environment. If producers of *Genipa americana* want to indicate to external parties that they are manufacturing in an environmentally sound way, then he can comply voluntarily with ISO 14001 or EMAS.

Exporters of *Genipa americana* might also be confronted with social requirements that are increasingly specified by EU market parties such as importers, retailers and end consumers. Although they are not part of official legislation, they need to be taken into account. The most important ones are discussed below.

ILO

Just as every citizen of the world, employees should be respected according to basic human rights. In order to formulate definition to employee's rights, the ILO (international labour organisation) is the UN specialized agency which seeks the promotion of social justice and internationally recognized human and labour rights. The ILO has installed Conventions and Recommendations setting minimum standards of basic labour rights.

The ILO Conventions are dealing with issues like: minimum wage, minimum age of workers, non-discrimination, freedom of labour organisation etc. ILO conventions are internationally accepted and provide an excellent source of information and guidance for companies.

SA8000

SA8000 is one of the most well known voluntary global standards to ensure social accountability. SA8000 includes standards in the form of a "Code of Conduct" which define what is considered social accountability as well as requirements for a management system which ensures the implementation of these standards in business policy.

The standards included in SA8000 are based on conventions of the International Labour Organisation (ILO) and other human rights conventions. By means of independent verification companies can be certified according to SA8000.

Useful website:

① ILO and SA8000: <http://www.ilo.org>

6.4 Requirements for packaging, marking and labelling

Packaging

Directive 79/831/EEC details 'laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances'.

The way in which blue and black colorants of *Genipa americana* are packaged and handled before reaching a food product, have an important effect on their functionality and usefulness. Packaging has to fulfil different requirements which depend on the product, the storage and delivery conditions. The exporter should reach an agreement with the importer as to what packaging he should use. Most of the natural colours are packaged in drums, solid boxes and cans. Packaging should protect colorants against:

- Moisture (hygroscopic natural colourings may lose functionality if they come into contact with moisture);
- Light (light-sensitive materials need to be protected against direct exposure to sunlight and fluorescent lights);
- Heat (most ingredients need to be protected from extremes in temperature otherwise they may lose their functionality);
- Oxidation (Some colorants require cold storage to prevent oxidation of pigments);
- Chemical reactions;
- Micro-organisms;
- Insects;
- Rodents.

Furthermore, the most important packaging requirements for colorants are that it conforms to existing laws and approval for direct contact with food (including accessories, such as printing inks, adhesives, etc.); no interaction between products and packaging material should be possible. Moreover, packaging should be convenient in its use and suitable for recycling.

Marking and Labelling

It is prohibited to mark or to label a food in a way that is misleading or deceptive to the consumer. Mandatory requirements are completed by controls which ensure that additional information provided voluntarily on labels is meaningful and not misleading. Labelling of final colorants must state the following information:

- description of the product and its name
- 'for the use in foodstuffs', 'limited use', etc;
- name of the producer;
- production code;
- batch code to ensure traceability;
- date of production;
- the net weight;
- date of tenability;
- hazard code;
- description as to whether the product is natural, nature identical, or synthetic.

Further, it is highly recommendable to include the following aspects on the label of food products:

- name, address and country of the producer/exporter;
- recommended storage conditions.
- Conditions for use and intended use
- Quality of product.

6.5 Tariffs and quotas

Tariffs on raw materials are generally low, in particular for raw materials like blue and black colorants of *Genipa americana* originating in developing countries. In order to support exports from developing countries, the EU operates the Generalised System of Preferences (GSP). Under the GSP scheme of the EU, imports from a number of developing countries are admitted at a reduced tariff and imports from a group of least developed countries at a zero tariff.

Developing countries, including Colombia and Peru, are exempted from import tariffs on colorants, including blue and black colorants of *Genipa americana*. No quota applies.

A form A or EUR I form has to be provided, in case a general tariff is applicable and the exporter from a developing country wants to take advantage of the GSP tariff.

① http://www.europa.eu.int/comm/taxation_customs/dds/en/tarhome.htm

7 Prices

7.1 Price developments

Price information for *Genipa americana* is not available. The market for colorants is extremely closed and therefore, obtaining information from European companies can be difficult. This also holds for the natural substitutes that have been identified, such as *Gardenia jasminoides*, indigo and logwood. Therefore comparisons between blue and black colorants of *Genipa americana* and its substitutes is not possible.

There are major differences in prices of natural colours, depending on the raw material and of the colour. Even the prices of one particular colour can fluctuate enormously. The price level is influenced by:

- **Quality factors.** The quality is determined by country of origin, the climate, the crop, the type of colour, the purity (colour grade), the state of microbiology, the odour and harvest situations.
- **Economic factors.** These factors are based on the demand and supply (the larger the supply, the lower the price). The supply depends on the size of the current crop, the carry-over from previous crops and the existence of synthetic substitutes.

In most cases, exporters will have to follow market prices, but for natural colorants these prices are difficult to come by. Moreover, in the case of many specialty products like blue and black colorants of *Genipa americana*, there is no real 'world market price'. If negotiations start with a prospective buyer, it could be the case that also the buyer does not know what the price of the products is. In those cases, the exporter will have to set its own export price. When negotiating prices with a buyer it is critical to know the point below which the exporter will not go. Determining this, and the export price, calls for an in-depth understanding and calculation of the costs of the product, overheads, and export costs and, crucially, how the cost of overhead is shared across the range of products. In some cases local market prices can also be taken into account. In the end, it is important to set the price in such a way that it is profitable for both the exporter and the customer.

When reviewing prices it is critically important to know the “price point” of the product. Important delivery terms are FOB and CIF. FOB stands for Free on Board and obliges the seller to deliver the goods on board a ship, which has been nominated by the buyer, and the buyer has to pay for the freight and insurance of the cargo the moment it is aboard the ship. CIF stands for Cost, Insurance, and Freight and obliges the shipper to deliver the goods to the buyer at a destination named in the contract and the seller pays for the insurance and freight.

7.2 Sources of price information

General price information for natural food colours is hard to obtain, due to an extremely closed market. It is therefore essential to have continuous access to up-to-date price information. As a rule, exporters receive this information through their business partner, insofar as he has no sales organisation or agency in the EU countries. Blue and black colorants of *Genipa americana* are a new product and therefore there are no sources of price information on these specific products.

8 Marketing strategies/prospects and sales promotion

8.1 Marketing and sales promotion strategies

Before turning to marketing and sales promotion strategies some concluding remarks should be made on blue and black colorants of *Genipa americana*. In general, there is demand for both blue and black colorants. However, some industry sources have indicated that the potential for blue colorants is likely to be larger. Making a market segmentation for the product is difficult. The demand from the food and cosmetics industry is difficult to assess without more detailed product information. This lack of information impeded importers in making predictions of the potential in either market. The stability in relatively high temperatures was seen as an important advantage by a number of importers, which could make the product interesting for both markets.

To be able to supply ingredients to the food and cosmetic industries it is critical that the following critical requirements, as identified in section 6, are complied with:

General requirements:

- REACH
- Technical Data Sheet (TDS)
- GACP / GMP
- CITES

Requirements for the food industry:

- HACCP
- Food colorants regulation (Directives 94/36/EC, 95/45/EC and 88/344/EC)
- E-number
- Food Directive

Requirements for the cosmetic industry:

- Cosmetics Directive
- Dangerous Substances Directive
- Material Safety Data Sheets (MSDS)
- EINECS and ELINCS

Meeting these requirements enables the exports on natural colorants to the European market. However, exporters will face competition by other suppliers offering similar products or substitutes.

Value addition

It is critical to verify if there are any possibilities to add value to the product in order to make the product more interesting for buyers in the European market. It can also provide that competitive edge needed to get a foothold on the European market.

Adding value to products starts at the factory. By processing fruits of *Genipa americana* into blue and black colorants means that the exporter have already taken a first step in such a process. Having the business processes (planning, cost-calculation, purchasing, etc.) organised is another major determinant of the quality of the export product and whether the exporter proves a successful supplier to European customers. In Section 6, the role of quality systems in this field was discussed.

For exporters of blue and black colorants of *Genipa americana* opportunities lie in the following fields and strategies.

Meeting technical data requirements

In the above marketing strategies providing prospective buyers or partners with sufficient technical information (technical data sheets) came forward as the principal bottleneck for natural colorants of *Genipa americana*. Therefore, meeting these data requirements is of principal importance for success on the European market. Of principal importance in this respect are considerations of health and safety. The requirements for natural colorants as were mentioned in chapter 6 are:

- | |
|--|
| <ul style="list-style-type: none">▪ Colour character and intensity;▪ Physical properties and chemical composition;▪ General purity and appearance;▪ Toxicity;▪ Stability;▪ Uniformity of quality;▪ Processability. |
|--|

Product documentation should contain detailed specification, backed by an independent laboratory, of these properties. It should be noted that certification can be used as a tool for establishing a good system of product documentation.

Overcoming technical barriers

In chapter 2, different technical barriers impeding wide-spread use of natural colorants have been discussed. These included high prices, a restricted colour range, less brilliancy and colouring power and instability (high temperatures and light). Therefore, more stable and durable natural colours offer possibilities in both the food and cosmetic market. As the liquid dark blue and black colours maintain their colour up to a temperature of 149 °C and the blue colorant is already stabilised producers can make use of these opportunities. These properties should be highlighted. More information on instability caused by light could also be of interest. Processing the colorant in a powder form will increase its marketability.

Obtaining organic certification

Although the market for organic products and natural products in general is comparatively small, the sector has shown higher growth than conventional markets. Because of this situation, there is a clear tendency towards more genuine natural colours. Marketing natural colorants as organic allows producers in developing countries to distinguish themselves from the mainstream products and there is a price premium attached. It may also be interesting in the case that producers can only supply small quantities of natural ingredients in the case of the natural ingredients discussed. Smaller quantities can be more easily marketed in the organic market than in the regular market, where traders require larger quantities.

Integrated chain control and value chain analysis

Due to increasing consumer attention for food safety, industry and trade in the EU are obliged to have full command and information on the whole food chain. Therefore, tracing and tracking of colorants for application in food products is increasingly required by food processors in the EU. Suppliers in developing countries who have a system of tracing and tracking, supported by documentation have a competitive advantage in dealing with EU importers.

Co-operation

The European colour industry is mostly in hands of large-scale producers. End-producers do business with a very limited number of suppliers, which are expected to offer tailor made solutions including ideas and services. For these companies to consider using new products they require detailed

information on the chemical and toxicological data of the product. In almost all interviews held with industry players this came up as the most important requirement. The supplier needs to be able to offer a thorough product information sheet. If producers of colorants cannot respond to such demands opportunities lie in supplying semi-processed colours to European processors who are better able to fulfil the special and changing needs of the EU market. However, many of these companies only import raw products.

One approach here is to develop mutually beneficial relationships with companies dealing in natural ingredients that may be able to support and guide the supplying company through the legislative requirements and assist with product design, distribution and marketing. These relationships can be exclusive in nature, which can be attractive for European companies. For the producers, in case there are several, it is recommended to look into co-operatives as way to cut on costs of quality control, market entry etc.

Quality systems

Although suppliers are not obliged to certify for GMP, GACP, HACCP and ISO those that do will have a major competitive advantage, as these certifications provide guarantees on quality assurance and food safety. Please note that from 2006 at the earliest, HACCP will become obligatory for non-EU producers as well. As meeting the demands for these certificates will draw substantially on the human and financial resources of the company the costs and benefits must be considered carefully.

Language and communication

- When dealing with European importers, English is the most frequently used language. Although most European trade partners will not be native speakers themselves, the vast majority speaks English fluently. In almost all cases, foreign language skills, particularly English, are essential when entering the European market. For Latin American companies, an exception is the competitive advantage they have if communicating with Spanish importers.
- All documentation (company profiles, technical data sheets, etc.) should be made available in English.
- It is advisable to commence with some communication measures that only require a small amount of planning and co-ordinating. A company brochure (including photos of production sites and produce) can be useful for promoting new contacts and sales.

Annexes

Annex 1: Sources of price information

INTERNATIONAL

FAO (Food and Agriculture Organisation)

Publisher of 'Monthly Bulletin of Statistics', 'Commodity and Market Review', and 'Food Outlook'

E-mail: FAO-HQ@fao.org

Internet: www.fao.org

International Trade Centre (ITC)

MNS Medicinal Plants & Extracts

E-mail: mns@intracen.org

Internet: www.intracen.org

UNITED KINGDOM

Agra Europe Ltd.

Publisher of 'The Public Ledger'

E-mail: marketing@public-ledger.com

Internet: www.public-ledger.com

INTERNET

Herb crop shop

(at Herb Growing and Marketing Network)

www.herbworld.com/cropshop

Sites for retail prices for herbal materials include:

www.herbmarket.com

<http://libertynatural.com>

Annex 2: Trade associations

AESGP Association of the European Self-Medication Industry

(Here, also a list of national self-medication associations can be found.)

E-mail: info@aesgp.be

Internet: www.aesgp.be

European Federation of Pharmaceucial Industries and Associations

E-mail: info@efpia.org

Internet: www.efpia.org

The European Pharmaceutical Wholesaler Association (Girp)

E-mail: euro.keys@euro-keys.com

Internet: www.girp.org or www.euro-keys.com

(A source of useful addresses is the Internet site: <http://www.girp.org/>)

European Scientific Cooperative On Phytotherapy (Escop)

E-mail: secretariat@escop.com

Internet: www.escop.com

The Association of European Producers of Medicinal and Aromatic Plants (EUROPAM)

E-mail: ottens.bart@hetnet.nl

Internet: www.europam.net

Annex 3: Trade fair organisers

BioFach (certified organic products)

NürnbergMesse GmbH

Frequency: annual (Nuremberg)

Internet: www.biofach.de

Cphi

Frequency: annual

E-mail: jekelschot@cmpinformation.com

Internet: www.cphi.com

Fi

Expoconsult B.V. trading as CMP Information

Frequency: annual

E-mail: fi@cmpinformation.com

Internet: www.fi-events.com

Health Ingredients Europe

Expoconsult B.V. trading as CMP Information

Frequency: annual

E-mail: fi@cmpinformation.com

Internet: www.hi-events.com

Natural Products Expo Europe

New Hope Natural Media

Frequency: annual

Internet: www.expoeurope.com

SANA

Exhibition of Health Food, Health and Environment

Frequency: biennial

E-mail: info@sana.it

Internet: www.sana.it

Vitafoods International Ltd.

Frequency: annual

Email: vitafoods@iirx.co.uk

Internet: www.vitafoods.co.uk

Annex 4: Standards organisations

INTERNATIONAL

World Health Organization (WHO)

E-mail: info@who.int

Internet: <http://www.who.org/>

International Standardisation Institute (ISO)

E-mail: central@iso.org

Internet: www.iso.org

UN/ECE

Trade Division - Agricultural Standards Unit

E-mail: info.ece@unece.org

Internet: www.unece.org

Joint FAO/WHO Food Standards Programme

Codex Alimentarius Commission ESN Division

E-mail: fao-hq@fao.org

Internet: www.fao.org

EUROPEAN UNION

CEN

European Committee of Standardization

E-mail: infodesk@cenorm.be

Internet: www.cenorm.be

Comité Européen de Normalisation (CEN)

European Normalisation Committee

E-mail: infodesk@cenorm.be

Internet: www.cenorm.be

SGS European Quality Certification Institute E.E.S.V.

E-mail: sgs.nl@sgs.com

Internet: www.sgs.nl

FRANCE

AFNOR

French Association of Normalisation

E-mail: communication@afnor.fr

Internet: www.afnor.fr

GERMANY

DIN

German Institute for Standardisation

E-mail: zentrale@dincertco.de

Internet: www.din.de

THE NETHERLANDS

NEN

Netherlands Institute of Normalisation

E-mail: info@nen.nl

Internet: www.nen.nl

UNITED KINGDOM

BSI

British Standards Institution

E-mail: cservices@bsi-global.com

Internet: www.bsi-global.com

ITALY

Ente Nazionale Italiano di Unificazione (UNI)

Italian Standardisation Entity

E-mail: uni@uni.com

Internet: www.unicei.it

Annex 5: Trade press

GERMANY

Drogenreport

E-mail: info@drogenreport.com

Internet: www.drogenreport.com

Pharma Marketing Service

E-mail: vertrieb@aerztezeitung.de

Internet: www.fachzeitung.com/content/detailinfo.php?id_fz=13563&id_verlag=61025060

Zeitschrift für Arznei- und Gewürzpflanzen

E-mail: order@agrimedia.com

Internet: www.agrimedia.com

ITALY

Agro Food

E-mail: info@teknoscienze.com

Internet: www.teknoscienze.com

Fitoterapia

Internet: http://www.indena.com/fitoterapia_profile.asp

UNITED KINGDOM

Nutraceuticals International

Telephone: +44 (0)20 7828 7272

Fax: +44 (0)20 7828 0415

E-mail: editorial@marketletter.com

Review of Aromatic and Medicinal Plants

E-mail: enquiris@cabi.org

Internet: <http://www.cabi-publishing.org/AbstractDatabases.asp?SubjectArea=&PID=51>

INTERNATIONAL

Herbalgram American Botanical Council

E-mail: abc@herbalgram.org

Internet: www.herbalgram.org

Journal of Herbs, Spices & Medicinal Plants

E-mail: getinfo@haworthpressinc.com

Internet: <http://www.haworthpress.com/store/product.asp?sku=J044>

Nutrition Business Journal

E-mail: info@nutritionbusiness.com

Internet: www.nutritionbusiness.com

An interesting source of magazines in the field of medicinal herbs is www.herbnet.com/press_p5.htm

Annex 6: Other useful addresses

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

E-mail: cites@unep.ch

Internet: www.cites.org

FI Data Services

Internet: www.ingridnet.com

GTZ Deutsche Gesellschaft für Technische Zusammenarbeit GmbH

Internet: www.gtz.de

International Chamber of Commerce

E-mail: webmaster@iccwbo.org

Internet: www.iccwbo.org

Netherlands Association for Phytotherapy

E-mail: nvf@fyto.nl

Internet: www.fyto.nl

Skal

(Internationally operating organisation, inspecting and certifying sustainable agricultural production methods and products)

E-mail: info@skal.com

Internet: www.skal.nl

Traffic Europe

(Joint wildlife trade monitoring programme of WWF and IUCN)

E-mail: traffic@trafficint.org

Internet: www.traffic.org

International Council for Medicinal And Aromatic Plants

E-mail: info@icmap.org

Internet: www.icmap.org

European Advisory Services (EAS)

Advisory company specialising in European and international food and nutrition policy (incl. herbal supplements).

E-mail: info@eas.be

Internet: www.eas.be

Earthscan Publication Ltd.

E-mail: earthinfo@earthscan.co.uk

Internet: www.earthscan.co.uk