BioTrade Facilitation Programme (BTFP)

Through its BIOTRADE Initiative, the United Nations Conference on Trade and Development (UNCTAD) works with partners in developing countries to promote trade in biodiversity products and services. These countries' increasing need for hands-on assistance in export promotion has led to the creation of a special trade promotion programme: the BioTrade Facilitation Programme (BTFP) for biodiversity products and services.

The BTFP helps enterprises in developing countries (for example small, medium, and community-based enterprises) with export promotion. To achieve this, it works with several partners in developing and developed countries. The programme supports products that have market potential and can be produced with the participation of local communities, without harming biodiversity. To develop and trade these products, sector plans are formulated and then implemented through a set of practical trade promotion services, including market information collection, product development, quality improvement, certification, labelling, trade fair participation and matchmaking. Selected countries from Latin America (the Andean and Amazonian regions), Africa (the eastern and southern regions) and Asia are currently part of the BTFP.

Priority product groups include edible plant products (e.g. fruit and nuts), food ingredients (e.g. colouring and flavouring materials), cosmetic and pharmaceutical ingredients (e.g. medicinal plants, essential fatty and aromatic oils), fibres, latex, resins, gums and gum by-products. These products have high value-adding potential and can generate local income by involving local and indigenous communities while also contributing to the conservation of biodiversity.

This programme is an official partnership of the World Summit on Sustainable Development (WSSD) and operates with financial support from the Governments of Switzerland and the Netherlands.

The International Trade Centre (ITC), a United Nations agency that assists developing countries with trade promotion, serves as the Programme's technical advisor. Other current BTPF partners include PhytoTrade Africa, Programme Bolsa Amazonia, BIOTRADE country programmes, the Dutch Centre for the Promotion of Imports from Developing Countries (CBI) and the Swiss Import Promotion Programme (SIPPO).

More information can be obtained at www.biotrade.org or at UNCTAD from Rik Kutsch Lojenga, kutsch@unctad.org.

Staatssekretariat für Wirtschaft
Secrétariat d'Etat à l'économie
Segretariato di Stato dell'economia
State Secretariat for Economic Affairs
seco

Ministerie van Buitenlandse Zaken
Ontwikkelingssamenwerking

Biocomercio Sostenible Peru

In 2001, the Peruvian BioTrade Committee was established to initiate the BioTrade National Programme. The Export Promotion Board (PROMPEX) was designated as the Technical Focal Point for the preparatory phase. It has been operating under the general guidance of the National Environmental Council (CONAM), which leads the Committee. The Committee includes relevant national stakeholders from the private and public sectors, as well as research and academic institutions.

More information can be obtained at www.biocomercioperu.org.

National Commission for Export Promotions (PROMPEX)

The Commission for the Promotion of Exports (PROMPEX) is a public Peruvian organization assigned to the Prime Minister Council and depends on a joint Public and Private Board of Directors. It seeks to promote the development of the Peruvian export supply, providing services and operative tools to improve national exports. It also aims to strengthen activities leading to accessing, consolidation and diversification of Peruvian products in foreign markets.

More information can be obtained at www.prompex.gob.pe.

United Nations Conference on Trade and Development (UNCTAD)

UNCTAD is the focal point within the United Nations system for development and related issues in the areas of trade, finance, technology, investment and sustainable development. Its main goal is to facilitate the integration of developing countries and economies in transition into the world economy and to promote development through trade and investment. In pursuing its goals, UNCTAD carries out research and policy analysis, intergovernmental deliberations and technical cooperation, and interacts with civil society and the business sector.

UNCTAD's Conference, the highest policy-making body, is composed of the 192 member states and meets every four years. The eleventh Conference was held in 2004 in São Paulo, Brazil. The executive body is the Trade and Development Board, responsible for ensuring the overall consistency of UNCTAD's activities with agreed priorities.

More information can be obtained at: info@unctad.org

Centre for the Promotion of Imports from Developing Countries (CBI)

CBI is an agency of the Netherlands Ministry of Foreign Affairs that was established in 1971 and operates within the policy framework set by the Minister for Development Cooperation. Its main objective is to contribute to the economic independence of selected developing countries by helping enterprises and trade promotion organizations (TPOs) to develop their export capabilities and promote their exports of non-traditional goods and services to the European Union. CBI recently initiated a new Export Promotion Programme for companies that manufacture or produce natural ingredients for pharmaceuticals and/or cosmetics.

More information can be obtained at: www.cbi.nl.

Abstract

This document provides an overview of the productive chain of natural ingredients for cosmetics and pharmaceuticals in Peru. It briefly describes market, social, technological, legal, and ecological aspects of the productive chain of cosmetics and pharmaceuticals on a more macro level. It then continues with an analysis at company and community level, examining the activities underway as well as the needs of local players. It ends with a description of the minimum elements that a strategy should contain to promote the development of this productive chain in Peru

Keywords: Value chain, productive chain, natural ingredients for cosmetics and pharmaceuticals, Peru, biodiversity, sustainable use, export.

CONTENTS

CHARTS

FIGURES

TABLES

List of abbreviations and Acronyms

ADEX	Exporters Association
BTFP	BioTrade Facilitation Programme
CBI	Dutch Center for the Promotion of Imports
CERTEX	Tax Refund Certificate
CITES	Wild Flora And Fauna Endangered Species International Commerce Convention
COMEX	Foreign Trade Association of Peru
CONAM	National Environment Council
CONCYTEC	Science and Technology National Council
CONIN	Natural ingredients National Commission
CUENCAS	Preservation and Sustainable Development Institute
FDA	Fodd and Drugs Administration (United States)
FOPEX	Non-Traditional Export Promotion Fund
GDP	Gross Domestic Product
GMP	Good Manufacturing Practices
GTZ	German Technical Cooperation
HACCP	Hazard Analysis and Critical Control Point
IBT	Biotechnology Institute of the Agrarian National University of La Molina
IEPLAM	Ecology and Medicine Plants Institute
IIAP	Peruvian Amazonian Research Institute
INADE	National Development Institute
INDDA	Agrarian Industrial Development Institute
INDECOPI	National Institute for the Defence of Competition and Protection of Copyright
INIA	National Agrarian Research Institute
IPPM	Peruvian Medicinal Plants Institute
IPPN	Peruvian National Products Institute
INRENA	National Natural Resources Institute
ITINTEC	Technical Standards and Industrial Technological Research Institute
MSDS	Material Safety Data Sheet
NGO	non-governmental organization
PROMPEX	National Commission for Export Promotion
PRONATURALEZA	Peruvian Foundation to Preserve Nature
SECTI	Technical Cooperation Executive Secretariat

I Introduction

This study is the result of a collaboration between Biotrade Peru - PBP, the National Commission for the Promotion of Export - PROMPEX, the National Commission of Natural ingredients - lCONIN, the Peruvian Institute of Natural Products - IPPN, the Institute of Agroindustrial Development - INDDA, UNCTAD's Biotrade Initiative and the Center of Imports Promotion of the `Netherlands – CBI. These institutions are promoting the development of bio-businesses. They have seen, as an entry strategy, the support of the sustained growth of a sector with great potential such as the natural ingredients one. The activities of CBI and CONIN should be highlighted. They were the ones to organize the First National Forum of Natural ingredients. Currently, the CBI promotes the participation of 10 private companies in the International Forum of Investment-New Ventures to strengthen their capacity to implement their business plans.

This assessment will reveal how the sector is structured and how it has been performing by identifying the participants' main problems and their causes, creating dialogue and finding common interests in order to promote changes that will allow sustained growth of the sector.

This document will offer an idea of the current situation of the exporting sector of natural ingredients, outlining its different components such as: market, agricultural production and technology, costs and prices, institutionality and parties, an analysis of the strengths/weaknesses/opportunities/ threats and finally the BTFP matrix to evaluate this sector.

II Background

The most significant activities that have brought benefits to the development of the natural ingredients sector were organized through state actions that promoted private initiative and resulted in growth of this industry.

As an example, we can mention the activities of the Fund for Export Promotion – FOPEX that carried out several feasibility studies on natural colorings and spices/medicinal plants and vegetable raw materials for the chemical industry in 1981. The purpose of these studies was to find out the potential of these resources as the fundamental basis to implement industrialization programs with export objectives. The potential of anatto/bixine, betanine, cochineal/carmine, curcuma/curcumine, cnocianine and marigold was examined. At that time, the most representative companies of this industry were the following: Sabores Globe, Zacarías Huyanas Chemical Industries and Preservatives Peru with exports of around 300,000 US dollars per year.

Currently, the revenues of the industry are around 31 million US dollars per year in the intenational market and 80 million US dollars per year in the domestic market. There are approximately 170 companies; 80 of them are exporting.

This growth has been achieved by companies that have invested in the industry of natural ingredients. These companies have taken advantage of new market trends and changes in

the patterns of consumer behavior. People are more and more conscious of responding to a heathier lyfestyle and to an environmentally harmonious consumption with biodiversity. Nowadays, the industry of natural ingredients is in private hands and stimulated by the state.

It is also necessary to highlight the activities of the Dutch Center for the Promotion of Imports – CBI that have strengthened the management skills of some companies with high growth potential through their Program of Promotion of Exports in the sector of natural ingredients. Other activites that should be emphasized are the training offered by "Expro seminar" in Holland and the Seminar in Sustainability of the Productive Chains in Ecuador, several technical consulting activities to participant companies, the financing for the participation in commercial fairs in Europe and the support in the National Forum of Natural ingredients and LatinPharma. It is also important to mention the studies that have been carried out in the sector of natural ingredients that provide an overview of the sector's current state.

Recently, in 2003, the activities that have strengthened the institutionability of the sector included the National Forum of Natural ingredients and the Latin Pharm. The goal of the first event was to outline the needs and to propose a working agenda. One of the results of this Forum was the recognition of the need of this assessment. The goal of the Latin Pharma event was to promote the intraregional trade of drugs and natural products. Similarly, it tried to gather experts and researchers in order to analyze the strengths, weaknesses and opportunities of the pharmaceutical industry and the natural products. This was a connecting platform among researchers, the university and the private sector.

III Objective

To evaluate the natural ingredients sector through the analysis of the structure and performance of some companies in order to identify their main problems and to propose solutions through strategic lines that would guide their development.

This assessment is directed towards the management of the export sector whose main activities are the production and trade of natural ingredients for cosmetics, pharmaceutical and food applications.

III.1 Group of Products

This assessment gives a description/analysis of the parties and their performance related to activities involving natural ingredients produced and exported in Peru, with a focus on the following 10 natural ingredients:

Natural Resource	***Scientific Name***	***Natural Ingredient***
1) Uña de Gato	*Uncaria tomentosa (Willd) DC*	*Cat's Claw Extract*
2) Maca	*Lepidium meyenii Walp* *Lepidium peruvianum Chacon*	*Maca Extract*
3) Camu Camu	*Myrciaria dubia (H.B.K) Mc Vaugh*	*Camu Camu Extract*
4) Tara	*Caesalpinia spinosa (Molina) Kuntze*	*Tara Gum*
5) Sangre de Grado	*Croton lechleri*	*Sangre de Grado Extract*
6) Muña	*Minthostachys mollis (Kunth) Griseb*	*Muña extract/Essential Oil*
7) Barbasco	*Lonchocarpus nicou L*	*Rotenone Extract*

8) Maiz Morado	*Zea mays raza Kcully*	*Anthocyanin from Purple Corn*
9) Yacón	*Smallanthus sonchifolius*	*Yacon Extract/Leaves*
10) Sacha Inchi	*Plukenetia volúbilis*	*Sacha Inchi Vegetable Oil*

III.2 Areas of Influence

The private companies, authorities and entities promoting activities related to natural ingredients such industrialization and trade located in Lima and whose activities go beyond the high-biodiversity regions.

III.3 Institutional Parties of the Public Sector

The following parties have played the most significant role in fostering growth in the sector:

a. *Comisión para la Promoción de Exportaciones (PROMPEX) Commission for Export Promotions – PROMPEX*

Through the management of the agrarian sector, this organism has been coordinating actions in order to offer technical-commercial assistance to companies in the natural ingredients sector. These actions include advice on topics such as the access to international fairs, participation in international events and seminars of the sector, assistance in the formulation of business plans for exports and diffusion of international regulations.

It is necessary to indicate that the productive chain of the natural ingredients sector is in its basic development phase. Therefore, Prompex, is promoting the development of the productive chain of all the involved parties such as producers, suppliers of goods and services, pharmaceutical industry, industry of foods, trading agents, research centers and certifying entities with the purpose of eliminating the serious deficiencies in production (low productivity, faulty post-crop handling, etc.), transformation (adoption of suitable quality standards) and commercialization (high degree of informality).

b. *Instituto de Desarrollo Agro-Industrial (INDDA) The Institute of Agro-industrial Development (INDDA)*

The Institute of Agro-industrial Development - INDDA, a part of the Agricultural National University of La Molina, cooperates with the development of the natural ingredients sector and medicinal plants, by means of the research and development of new products or processes and the transfer of technology. The INDDA is qualified to define processes and to apply formulations to a great variety of products. As a result, the interested parties can evaluate their commercial possibilities, as if they themselves had elaborated these studies.

c. *Instituto Nacional de Investigación Agrícola (INIA) Agricultural Research National Institute (INIA)*

The INIA coordinates and promotes the development of activities related to genetic resources, protecting, preserving and handling them in the country. In this framework, and under mandate, the PRONIRGEB is in charge of a network of 9 experimental stations. Currently, as a result of the collections, there are three banks of aromatic and medicinal

plants strategically located: 31 coastal species (central headquarters INIA, LaMolina), 40 andean species (EE Andenes-Cusco) and 19 jungle species (EE Pucallpa).

Also, in the framework of the "in situ" conservation project of native crops and their wild relatives, the INIA is developing and leading the Research Institute of the Peruvian Amazon (IIAP), whose headquarters are located in Loreto. They are registering plants and natural ingredients in the setting of 48 communities in the three natural regions of the Peru.

d. Instituto de Biotecnología (IBT) Institute of Biotechnology (IBT)

The Institute of Biotechnology (IBT), as part of the Agrarian National University La Molina, has the mission of carrying out multidisciplinary research programs and integrating areas involved in the use of biotechnology techniques that will improve the education level and promote the incorporation of these techniques in the agroindustry setting, especially in the sector of natural ingredients and medicinal plants. Its main objective is the development of research, technology transfer and production of quality products with proven efficiency for the development of agriculture and industry in Peru. The IBT has developed new techniques to obtain high quality plants, free of diseases. Examples of the IB's work in the sector natural ingredients include the cúrcuma or palillo, maca, cat claw, sangre de grado, stevia and yacon.

e. Instituto de Ecología y Plantas Medicinales (IEPLAM) Institute of Ecology and Medicinal Plants (IEPLAM)

The proposal of the IEPLAM and the committees of growers of medicinal and aromatic plants is the implementation of policies that take advantage, in a rational way, of the existent medicinal and aromatic resources on the hillside lands, the riverside areas of the creeks and irrigation channels. Since 1991, several activities have being carried out like propagation, reforestation, harvest, transformation and commercialization of essentials oils of the some aromatic shrubs and sub-shrubs species that have demand in the ecological market. These include the arrayán (Luma check-Myrtaceae), cedroncillo (Aloysia herrerae-Verbenaceae) and chiri-chiri (Grindelia Bolivian-Asteraceae) due to their healing and aromatic value.

f. Consejo Nacional de Ciencia y Tecnología (CONCYTEC) Science and Technology National Council (CONCYTEC)

At present, the productive development represents a high-priority component in the operative program of CONCYTEC. This means that more funds will be directed to product research (giving priority to native products) and to diffuse activities of the productive sectors. The management of the programs of this institution has acknowledged the importance of being involved in development activities of the natural ingredient sector.

g. Instituto Nacional de Desarrollo (INADE) National Development Institute – INADE

It is a descentralized public organization that depends on the Ministry of Housing, Construction and Sanitation with the objective to direct, coordinate and evaluate multisectoral, social development and employment generation projects. These projects are executed directly or by third parties.

The INADE, by means of its Unit of Administration of the Sustainable Development Plan of the Amazonia (PDSA), has defined nine geo-economic units based on an assessment that considered the decisive factors for a sustainable development of the Amazonia.

Instituto para la Conservación y Desarrollo Sostenido (CUENCAS) Preservation and Sustainable Development Institute –CUENCAS

The Institute Cuencas works in microbasins of impoverished rural areas in the north highlands of Peru where the erosion of natural resources is advancing dangerously towards a desert-like territory making the survival of rural families very difficult. At the moment, the institute is carrying out actions in the Department of Cajamarca in three pilot micro basins located in the provinces of Cajabamba, San Marcos and Cajamarca.

h. Instituto Nacional de Recursos Naturales (INRENA) Natural Resources National Institute – INRENA

It is a decentralized public organization of the Ministry of Agriculture whose main objectives are to handle renewable natural resources in a rational and integral way and to take care of these resources to achieve a sustainable development. Uncaria Tomentosa and Uncaria Guianensis (cat claws) are the two natural resources that have been promoted under this policy. A manual for the use of the cat claw in natural forests was prepared in 1997 in coordination with the National Institute of natural Medicine, INMETRA. This is serving as a guide for the farmer, technical extractor, extensionist and other interested people, thus, contributing to the best use of these resources in our forests of the Amazon. This would allow an alternative for the development of the populations in a sustainable handling framework.

III.4 Institutional Parties of the Private Sector

a. Instituto Peruano de Productos Naturales (IPPN) Natural Products Peruvian Institute – IPPN

The IPPN is one of the two most important entities of the sector in Peru (the other one is ADEX). It is a private institution dedicated to promote productive and commercial activities within the sector of natural ingredients. Its goals are to assist the needs of its partners, through the diffusion of their activities, and to facilitate the communication with promoting and trade entities. It groups about 20 export companies that meet to solve structural and relevant problems that affect the sector.
In 1999, in the premises of Prompex, the first act of the Peruvian Institute of Medicinal Plants (IPPM) was signed. It was registered as legal institution in 2000. The IPPM is a civil, non-profit association constituted to promote the conservation of the biological diversity, through the development and transformation of natural products with added value and has the following objectives:

- Promote the conservation of biodiversity
- Promote medicinal plants research
- Improve the socioeconomic conditions of local communities
- Promote the crop and processing of Peruvian medicinal plants
- Promote exports of medicinal plants with added value
- Promote job creation

Seek the optimization of the quality of finished products and improvement of the image of Peruvian products, generating a new positioning

In 2002, this institute changed its name to Peruvian Institute of Natural Products being the first and only private party that promotes the development of the natural ingredients sector.

The Peruvian Institute of National Products-IPPN has a national plan of activities for the development of the market of Peruvian medicinal plants, with a budget of $US 2,565,064.

b. Asociación Peruana de Fitofarmacia (APF) Phytopharmacology Peruvian Association (APF)

This association is coordinating, among other things, the work conducted to meet the norms and regulations. The lack of fulfillment is delaying the development and could cause a collapse of this sector.

c. Asociación de Exportadores (ADEX) Exporters Association (ADEX)

The role that ADEX plays in this sector is highly important since it groups a large number of exporters under the entry of "non-traditional products". This label facilitates the grouping of export companies that are organized in this association. In addition, the sector of agrarian products of this association is part, at the moment, of the coordinating committee of the association of plants and natural ingredients sector. They have already begun their activities through the formation of technical groups.

d. Comité Biocomercio Perú (PBP) Peru Biotrade Committee (PBP)

The PBP has the general objectives of promoting and supporting the consolidation of bio-businesses in Peru. It concentrates its efforts through two action axes: development of productive chains and demonstrative projects which are strengthened through a platform of service such as:

- Information of markets and commercial promotion
- Promotion of the investment in bio-businesses
- Technical assistance and environmental culture

Currently, it provides support to the natural ingredients sector through the formulation of this assessment and the participation of the IPPN meetings with the goals of learning about their needs, guiding them towards demands and linking them with the entities that facilitate their activities. The challenge is to sign agreements that would allow the companies of the sector to have linkage with the production units.

III.5 International Cooperation Organizations

The international organisms that are collaborating in the development of the natural ingredients sector are:

a. UNCTAD-BIOTRADE: Programa de Facilitación al Biocomercio – BTFP BioTrade Facilitation Programme (BTFP)

The BIOTRADE initiative (www.biotrade.org) is a program of the United Nations Conference for Trade and Development (UNCTAD) that stimulates development, trade and investments in biodiversity products and derived services in underdeveloped countries to promote sustainable development, in accordance with the three basic objectives of the Agreement on Biological Diversity. The Biotrade initiative has established national and regional programs that benefit the public, private and academic sectors, the local and the indigenous communities, the non governmental organizations (NGOs) and other institutions in the development of sustainable business and services to facilitate trade, promotion of exports and search of capital.

BIOTRADE has created the Biotrade Facilitation Program whose objective is to facilitate a sustainable trade of biodiversity products and services. In the beginning, the BTFP will give priority to groups of products like eatable vegetable species, nutritious ingredients, cosmetics and pharmaceutical articles, fibers, latex, resins and gums. Many of these products are the object of a growing demand from national and foreign consumers and have a great potential to generate products with an added value.

Currently, the BTFP program supports the natural ingredients sector through a collaboration with the producing and exporting companies of natural ingredients in two areas: commercial information and marketing strategies. Likewise, it facilitates the linkage of parties that promote the development of this sector so that they work in a cooperative way, thus, saving resources and encouraging a better performance.

b. Centro de Promoción de Importaciones de los Países Bajos – CB Netherlands Import Promotion Center (CBI)

The objective of the CBI is to contribute to the economic independence of a group of underdeveloped countries by assisting companies and promotion organisms to develop capacities that will improve their exports and promote them in the European Union.

At the moment, the CBI is supporting three national companies (Agroindustrial Chanchamayo SRL, Ecopro SA and R. Muelle SA) to establish their productive chain from the identification of suppliers of raw materials from biodiversity with a sustainable handling to the participation in events and specialized fairs for the promotion and sale of their natural ingredients.

c. Swiss Agency for Development and Cooperation / COSUDE.

- Biodiversity Project and PYMAGROS

Through their Biodiversity Project, they seek the conservation and increase of the biodiversity of Andean roots and tubers. The objective of the current phase of the project is to optimize and standardize the quality of the olluco, maca, oca and yacón.

The PYMAGROS Project, in its current phase, has the objective of improving the linkage between the demand and offer of the highland in three lines of Andean products and their byproducts (Andean grains, fruit-bearing/aromatic plants and medicinal plants) with emphasis in their transformation and commercialization.

d. Programa Suizo para la Promoción de Importaciones – SIPPO Swiss Programme for Imports Promotion – SIPPO

It promotes the imports of finished and semi-finished products from underdeveloped countries. SIPPO selects the groups of products to be supported by a set of criteria such as readiness of the resource, competitive advantages, existence of export oriented producers and an identified demand on behalf of the Swiss and European Community importers.

IV Conceptual Framework

In order to facilitate the reading of this assessment, it is necessary to clarify the most important terms used through the following concepts:

IV.1 Natural ingredients Concept

Natural ingredients are raw materials that come from animals or vegetables and their corresponding by-products that are added to the transforming processes with the purpose of obtaining final products with an added value for human consumption. Natural ingredients are broadly used in the following industries: cosmetic, pharmaceutical, nutritional, nutraceutic, cosmoceutic, among others. The last two options do not have a formal definition but are broadly used to refer to products that have the combined use of nutritious-pharmaceutical and nutritious-cosmetics, respectively. Nowadays, a great variety of natural ingredients are used around the world. The most common are:

- Medicinal and aromatic plants
- Sap and vegetable extracts
- Vegetable alkaloids
- Vegetable and essential oils
- Natural gums and waxes
- Natural colorants
- Resins and oleoresins

IV.2 Biobusinesses Concept

Biobusinesses are the companies in Peru that carry out activities or deal with resources that come from the native biodiversity. They apply the principles of environmental sustainability, social fairness and economic profitability to their management. Biobusinesses are oriented towards the generation of a positive economic, social and environmental profitability.

IV.3 Productive Chain Concept

A productive chain is an economic development approach that makes it possible to see a productive and commercial system as a dynamic system integrating a series of activities, processes and parties in a very connected and interrelated manner similar to the links of a chain.

IV.4 Sustainable Development Concept

A continuous and renewable process of the human activity that deals with the improvement of capacities that, when dealing with the environment, looks for a way to take

advantage of their resources in a permanent manner and according to their necessities, aspirations and potentials. The goal of sustainable development is the human well-being in harmony with the environment.

V Methodology

To carry out this assessment the following steps have been followed:

- Collection of primary information
- Interviews with the main economic agents
- Interviews with experts and entities involved in the promotion of the sector
- Perception of the structure and performance through:
    a) Analysis of primary information
    b) Organization analysis
    c) Participation in associations
    d) Knowledge of interinstitutional support platforms
    e) Knowledge of international programmes
    f) Identification of interests and perception of the problem
- BTFP Assessment Matrix
- Feedback
- Conclusions and recommendations

VI Sector Structure

VI.1 Agricultural Production and Technology

VI.1.1 Production

Peru has an agricultural production that represents a vast supply source for the natural ingredients sector. In the coastal and mountainous areas, Peru grows tubers such as maca, arracacha, yam and yacón that are used as nutraceuticals. In addition, Peru produces plants such as muña and eucalyptus for the pharmaceutical and cosmetic industries. Moreover, Peru produces insects such as the cochineal and plants such as marigold, purple corn, cúrcuma, paprika that are used in the industry of the natural colorants.
Additionally, Peru extracts from the Amazon region camu camu, cat's claw, barbasco, sangre de grado, chancapiedra, chuchuasi, ojé, copaiba and other leaves, barks and roots used mainly for medicinal and nutritional purposes. There are no production statistics on the above-mentioned resources.

Figure 1 Structure of natural ingredients supply

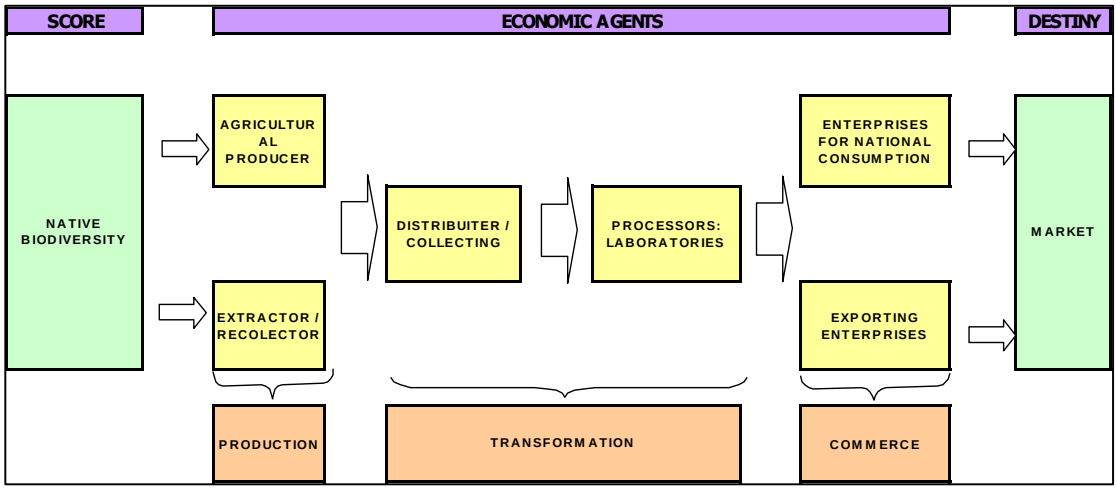


Figure 1 shows the supply process for natural ingredients. In general terms, there are two main supplying entities: the extractor/collector and the agricultural producer. The difference we make regarding the resources that are "produced" in the coast and highland versus those that are "extracted" from the Amazon region should be highlighted. In the jungle, the dominant natural resources are the forest, the rivers and the bodies of water. The condition of the soil and the continuous flooding limit the production and there is no control of certain variables that characterize the agriculture that is carried out in the coastal and highland regions.

"Collection is the dominant form of medicinal plants production. It is the initial part of the supply chain for the pharmaceutical, chemical and other industries. However, this extractive activity is not organized, or linked formally to other intensive processing stages. The collectors and middlemen respond to the needs of the processing companies that impose rules, prices and purchase volumes." Nalvarte W.,1999

The sustainable use of these resources is supported by some initiatives of the state and of the work of environmental NGOs. However, these efforts have not been sufficient. Many programs are oriented towards strengthening the productive aspects and the good handling of resources. This is improving productivity and the organizational aspects of the community work with the idea to improve its administration and commercialization. They do not consider the market forces that demand resources and they do not care about the origin and the way they are obtained.

Without any legal basis and social practices that would arrange and guide the use of the natural resources and make them sustainable, the extraction will continue being a practice that is socially accepted and looting is a natural consequence.

There is no favorable linkage between the productive parties of raw materials of the natural ingredients sector. They are linked but the benefits are not equally distributed. There are opportunities which could add value to raw materials by adding processes such as cleaning, selection, classification and calibration, which would improve the benefits of the productive parties. The socioeconomic evaluation shows that this sector has a high potential for creating employment. This is because the growth of the market would induce

a bigger and better organization of producers. Likewise, a better linkage would diminish the transaction costs and it would result in more benefits for the most efficient parties. Finally, it has been recognized that gender equity and generational equity are not sufficiently developed in the productive sector. The relationships in production between men and women show inequalities that do not favor the participation of women in the decision-making process (mainly in production benefits) and do not take advantage of women's potential in her condition of being a good administrator.

VI.1.2 Ecological Production [1]

The ecological production in Peru, as it is understood nowadays, had its origins in the beginning of the 80's with the work carried out by several organizations of producers, research centers, technical and training assistance that conformed the Ecological Agricultural Network, Peru RAE. In 1998, during the Third National Encounter of Ecological Producers, the National Association of Ecological Producers of Peru, ANPE-PERU was formed in Cuzco. Its goals were to improve the quality of life of families that have chosen sustainable agriculture, to facilitate an appropriate trading process, to help the local leaders and producers that apply ecological practices and to link them in the organic chain formed by producers, trading agents and certifying agents.

The work of ecological certification began in 1988 with the participation of several foreign certifying companies. A national certifying system has operated since 1994 and recognized by the main destination markets (the European Union, the United States and Japan).

In 1997, a National Commission started to work and created the National Commission of Organic Products (CONAPO), which among other activities, is designing a legal framework to support producers as well as consumers of organic products.

Currently, this process has certified over 10,000 organic farmers in Peru. Our country occupies the fifth place in the world with more capacity to use ecological agriculture.

The most important products with organic certification are: coffee, cotton, vegetables and fresh fruits such as mangos, bananas, grapes and papaya, native and exotic fruits, bearing trees, tubers and Andean grains such as quinua, kiwicha, yacón and maca. Other crops include, sesame seeds, olive and olive oil, palm hearts, subtle lemon, and a wide range of natural colorants and aromatic and medicinal plants.

It is important to highlight that there has been a traditional tendency for ecological handling in Peru since ancient times; this is a culture oriented towards the conservation and the rational use of resources. This has produced a larger number of farmers which practice a sustainable agriculture.

[1] For the purpose of this assessment, the terms *ecological* and *organic* shall be considered as equivalent, as the characteristic of the agriculture that uses biopesticides, that undertake friendly agricultural practice towards the environment, in such a way that highlights the beneficial properties of their final products and allow a sustainable use of the resources that make part of this productive process.

Moreover, there is also an appreciable number of producers in a transition process towards ecological agriculture. This would increase, in the short and medium terms, the offer and the diversity of organic products.

The most important natural ingredient produced in an ecological way is tara gum which is a natural hydrocolloid used as a nutritional supplement in the pharmaceutical and cosmetic industries. Other important natural ingredient is cube, whose processing yields rotenone extract, used as a biopesticide in organic agriculture.

VI.1.3 Transformation

As Figure 1 indicates, there are two types of economic agents transforming natural resources and adding value by certain transformation degree: collectors/pickers and processors/laboratories.

The collectors and pickers provide only a simple process of transformation performing the following tasks: tree barking, cutting in easy to handle sizes, extracting liquids mechanically, drying and milling, and other things. They are in permanent contact with their suppliers, producers and extractors.

The processors/laboratories are exporting companies with advanced technology and organized processes. For example, the pharmaceutical companies that have been in the market for over 50 years. However, there are still many companies that carry out simple industrialization processes (physical and mechanical processes) such as drying, milling, powdering and micropulverization which do not increase the added value of the products. Additionally, there are many handicraft companies that have very limited production and do not have high quality standards. This situation is a very challenging one and it is the leverage point for growth.

The case of biopesticides: muña (Minthostachys mollis) and cube (Lonchocarpus nicou) are the basis for the industry of natural agrochemicals or biopesticides. We have examples of products based on different formulations of rotenone, extracted from cube, which are natural organic substances, biologically active with great insecticide power.

VI.1.4 Technological Development and Research

An important component of transformation is research. This is an important limitation for the sector. There is shortage of scientific and technological information on natural ingredients. There is also a lack of information on clinical tests which could verify the benefits of national nutraceuticals. Moreover, there are serious research limitations that restrict the accessibility of composition and chemical analysis, therapeutic value, toxicological analysis, among other things. These are the most common demands made by market importers of natural ingredients. The exporters do not have a research center for natural ingredients or an institutional cooperation mechanism to cover these needs.

The exporter community has the difficulty of solving common problems such as finding a reliable laboratory that would carry out analysis in less than 24 hours. For example, the analysis of carminic acid in cochineal or bixine in anatto, heavy metals either in Cochineal or in natural colorants, ASTA in paprika, or a toxicological analysis of maca, among other things. All laboratories and/or Institutions that perform these types of analysis need almost 3 working days to issue a certificate for the aforementioned analysis. The decision-making process on purchasing/buying raw materials and its logistics process become very difficult.

The sector has the complex technology to process these raw materials but it is generally concentrated in Lima. At the provincial level, on the other hand, simple and intermediate technologies are available for the raw material processing.

The primary treatment of raw materials is being performed partially by the producers in the provinces; however, there is still a lack of development in these skills at the community level. At the same time, the sector has not taken full advantage of the traditional knowledge of native resources on a larger scale, which would allow a more equitable relationship between the managers that have the most advanced technology.

VI.1.5 Trading

Trading has two important economic parties: agents devoted to supplying the national market and the exporting companies that supply the international market. In chapter VII, the performance of the exporter sector is discussed. The scope of the assessment will also cover the description and analysis of the exporter sector.

Current market information on this limits the estimation of the market demand. It is known that there is an increasing demand of products from this sector; however, tariff barriers could limit the export offer.

The production scale is reasonably organized and could be commercially attractive. There is even an idle productive capacity and a vast supply source. The natural ingredients are already sold in the markets where quality standards are high; however, there is a lack of technical norms to guide production and support those standards.

In the case of organic agriculture, the main byproducts of natural ingredients are biopesticides. The national market includes over 10,000 farmers. These farmers demand raw materials for use in organic production such as different organic solutions made from rotenone (a natural bio-insecticide) for disease control without altering the environment, highlighting the innocuous quality of food harvested in this manner

This is the basis of the Peruvian organic products for the international market which is calculated at 21 billion US dollars with a potential growth of approximately 20 to 30% annually. The main countries of this global market, in billions of US dollars, are the United States with 9.5, Europe with 9, Germany with 2.5 and Japan with 2.

VI.2 Biodiversity and Environmental Issues

Peru is recognized as a country with high biodiversity. However, environmental considerations have not been institutionalized and they do not reflect the concern for a sustainable use of resources by most of their public administrative and main private

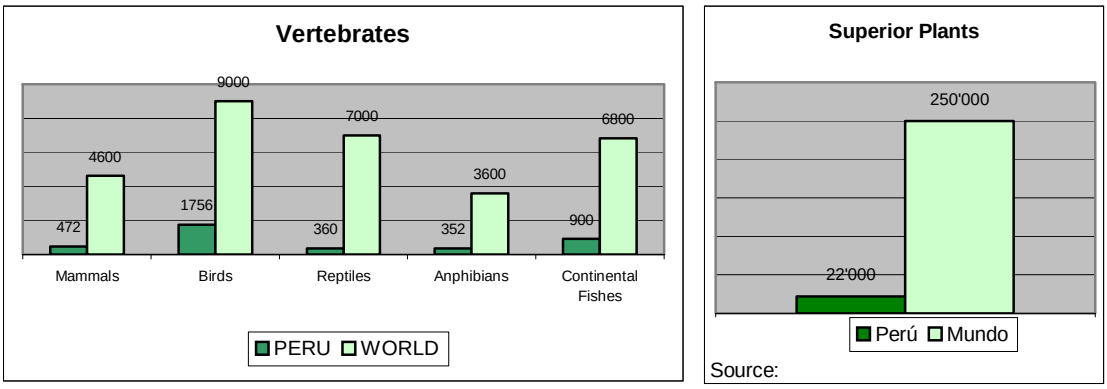
entities that cover the demands of the market. The latter ones do not consider the possible consequences of over-exploitation of their biodiversity resources. The efforts to achieve development in harmony with the environment are guided by territorial classification, use of forest resources (by means of forestry concessions), use of bodies of water and their resources and defending the rights of indigenous people.

The major advances to raise public awareness and to regulate the use of the biodiversity have been achieved by the CONAM. This is the entity in charge of creating and promoting national environmental policies, combining sector efforts and promoting the participation of the private sector and the INRENA (the control and supervision entity of this policy). It is also necessary to highlight the achievements made by projects and programs of the NGOs that have contributed to the diffusion of environmental awareness, through the development of mechanisms and methodologies that promote the conservation and the good use of environmental resources.

Peru is a country with major biological wealth. There are 472 species of mammals. The variety of continental fish is enriched by other endemic marine species. In the Manu region, 1300 species of butterflies have been identified. In Europe, on the other hand, there are only 441 species. Chart 1 shows the extent of biodiversity in Peru.

Much of this animal and vegetable biodiversity is concentrated in the natural forests. From the 128 million hectares registered as the national territory, 82 million hectares (64% of the national territory) have some type of forest component.

Chart 1 Biodiversity in Peru



According to studies performed by the INRENA, it is known that the Peruvian Amazon Forest originally had 75.7 millions hectares. At the end of 2000, there were 66.4 millions hectares; therefore, 9.3 millions hectares have been deforested. In Peru, there are 56 protected natural areas (ANP) that in total make up an extension of 16 million hectares. Inside the Amazon forest, there are 5 of the largest protected natural areas in South America. In Peru, the largest one is found in the National Reservation of Pacaya Samiria with 2 millions hectares (located in the Loreto region). A great part of the native biodiversity of tropical origin is found in this forest.

Table 1 Structure of Peru's Forest Resources

Formación Vegetal	Area (millons de Has)	(%)
Rain Forest	56,90	69%
Special Forning of life	10,46	13%
Forest and bushes in semidesetic areas	6,74	8%
Deforestated Areas	6,90	8%
Forest and Bushes in subhumind areas	1,60	2%
Tot.	82,60	100%

Source: INRENA

The impact of the development on biodiversity is direct and there is a risk of negative effects such as those that have occurred in the Amazon with rubber, barbasco, cat's paw, etc. These products have been under constant looting and their natural repopulation has been prevented in some areas. However, there are experiences of good handling that have been very positive like the identification of productive systems. Examples of this work is the discovery of the productive system in restiga baja with white waters from the Andean region which protect and favor recovery of the environment and allow the natural reproduction of camu camu. (IIA,2001).

It is important to emphasize that this sector can contribute very significantly to the sustainable handling of biodiversity. Given the trend towards environmentally friendly practices, private entities need to be involved in this area to reach a larger potential. The implementation of handling plans and certifications in good agricultural practices/good manufacturing practices directly benefit the handling of biodiversity and, at the same time, allow a continuous and sustainable supply of raw materials to the companies. The sector of natural ingredients allows the establishment of productive chains that involve more equitable and fair conditions for the rural communities, the indigenous towns and the small and medium-sized companies. These concepts favor a culture of respect for the rights of others and for biodiversity of the environment. They will hopefully have an impact in the development of the country.

The awareness for respect and environmental culture should be promoted. Otherwise, the efforts already made in the sector would be in vain. The efforts will be frustrated by environmental problems that would limit the sustainability of production and, in general, the use of natural resources. Currently, there is limited knowledge of private companies of the natural ingredients sector about the need of carrying out plans for the handling of natural resources. This is due to the fact that these companies have contacts with their natural resources collectors/suppliers, who in turn, buy from the pickers of the forest or producers from the highlands without any criteria regarding good environmental or agricultural practices.

Nevertheless, some private companies in this sector are changing their attitude regarding sustainable productive practices. Companies that have received the support of CBI/Biocomercio Peru (Ecopro and Agroindustrial Chanchamayo) have already taken

conscience of managing biodiversity products and following this line of action. Ecopro is trying to work with native communities and Agroindustrial Chanchamayo has stated that it is working with organized groups of families to produce maca in Junin.

Compañía Agroindustrias Backus SA, who has also received the support of CBIT, is a company in a transitional stage because the stocks of the group were bought. The policy of the enterprise on agroindustrial projects such as camu camu has not been defined yet. The company broadcasts a program called "Defending Nature" in Radio Programas del Peru, a radio station that reaches the whole country. This program promotes the consumption of biodiversity products.

Finally, even though the different species that come from the biodiversity are found in enough quantities to cover the demand, the sustainability of their use could present risks in the long term. The institutions that manage, control and enforce the laws for a sustainable environment have serious limitations to carry out their functions. There is no suitable certifying mechanism. Efforts are underway to make the economic entities aware of better ways of handling natural resources. While there have been achievements in this area, they are limited and insufficient. For example, there is organic production but the financial resources that would facilitate certification are lacking.

VI.3 Legal Framework

At present moment, there is no legal policy that encourages the exports in the field of natural ingredients. The government provides no specific incentives to promote exports of less known products. The managers do not have tax incentives except for the drawback mechanism that returns to the exporters 5% of the value of their export, through a fiscal credit.

The following are some laws related to biotrade within the national and international legal framework:

VI.3.1 National Legal Framework

a. Laws concerning the Conservation and Use of Natural Resources:

These laws rule the conservation and use of natural resources starting from the environment that produces them. The laws are appropriate and complete because they reflect the most important needs and rule and regulate the way the economic agents should use natural resources in a sustainable way. The capacity to enforce the law is the responsibility of INRENA. However, its capacity to enforce the law should be improved.

- **Law 26821:** Organic Law for the Sustainable Use of Natural Resources. It rules the regime of sustainable use of natural resources setting the conditions and the ways of granting licences to private entities in compliance with the Political Constitution of Peru, the Environmental Code and ratified international agreements signed by Peru.

- **Law 26839:** Law on the Conservation and Sustainable Use of Biological Diversity. It rules the conservation of biological diversity and sustainable use of their components.
- **Law 27308:** Forest and Wild Fauna Law. It rules, regulates and supervises the sustainable use and the conservation of forest resources and wild fauna in the country.

- **The Supreme Ordinance Nº 014-2001-AG**: Regulations of the Forest and Wild Fauna Law. It regulates the activities related to the management and administration of forest and fauna resources. It emphasizes the functions of INRENA such as granting authorizations to extract forest resources and wild fauna for scientific research or cultural diffusion purposes to people and institutions, safeguarding the rights of the country with respect to its native genetic patrimony.

- **Law 27300:** Law of Sustainable Use of Medicinal Plants (08/07/2000). It appoints the Ministry of Agriculture (through INRENA and INIA) as responsible for formulating strategies, policies, plans and norms for the classification, use and conservation of wild medicinal plant species.

b. Laws Concerning Production

These are laws that are not still sufficiently well known. They are adequate but have a limited scope and they do not efficiently promote the production on a national scale. The entities in charge of these laws do not have enough resources to develop production to levels in accordance with the potential of the sector.

- ***Law 27300:*** It indicates that the INRENA, in coordination with the IIAP, INIA, Universities and INMETRA (now CENSI), must promote the creation of botanical gardens of medicinal plants, seedlings and nurseries in rural and native communities as well as in marginal urban areas. This is to force the creation of programs for the recovery of well defined ecological areas with species of great demand in the national and international market.

- ***Supreme Ordinance 046 -99-AG:*** It sets up arrangements to promote plantations of camu cam, as it is indicated in its first article: "It is of national interest to promote plantations of camu camu (Myrciaria dubia), to support sustainable and socioeconomic development of the Amazon region and to contribute with the handling of water resources".

- ***Ministerial Resolution 0021-200-AG:*** It approves the National Program for the Promotion of Plantations of Camu Camu. This regulation in its second article states: "The Unit for the Development of the Amazonia - UDA of the Ministry of Agriculture, the National Institute of Natural Resources - INRENA and the Agrarian Regional Direction are responsible for the execution, follow-up and assessment of the program approved in the precedent article".

c. Law concerning Processing

There is a legal gap in this regard. There is no law regulating the processing of natural ingredients. However, there are lower-level legal norms governing the processing of products for medicinal use. Similarly, there are no norms governing the processing of natural colorants. The principles that guide good processing practices have been standardized by means of manuals.

- ***R.M. 125-2000-SA/DM***: Manual of Good Manufacturing Practices of Medicinal Products and Natural Therapeutic Resources. This is a set of minimum norms that guarantee the fulfilment of appropriate procedures for obtaining products of uniform and satisfactory quality. It ensures that all the production lots are elaborated with raw materials that meet suitable quality control standards. In addition, it also makes sure that the production lots are stable during their useful life and properly packed and labeled.

- ***R.M 585-99-SA/DM***: Manual of Good Storage Practice . This is a set of mandatory minimum norms that should be met by establishments that store pharmaceutical and similar products with the purpose of guaranteeing that the characteristics and properties of the products are maintained. It establishes norms regarding the facilities, equipment, documentation, personnel, and operating procedures regarding reception, storage, distribution, dealing with claims and withdrawing products from the market.

d. Law concerning Trading

They are declaratory, well-intentioned and clear laws. However, the awareness of the key economic players has to be raised thorugh diffusion.

- **Law 27821**: Law of Promotion of Nutritional Complements for the Alternative Development It states that it is of national interest to promote production, processing, commercialization and export activities of products of animal, vegetable and mineral origin for traditional use in nutrition, conservation of health and in the prevention of illnesses.

- **Law 26842:** General Law of Health. The commercialization of medicinal plants and their different presentations (extracted, freeze-dried, distilled, dyed, cooked or any other medical preparation) with therapeutic, diagnostic or preventive purposes is subject to this law. The medicinal plants that are offered without making reference to their therapeutic, diagnostic or preventive properties can be freely marketed.

VI.3.2 International Legal Framework

Two international norms that affect the performance of the sector of natural ingredients in Peru are described in the following paragraphs:

e. The Convention of Biological Diversity (subscribed by Peru in 1975).

It adopted the Global Strategy for the Conservation of Plants (Decision VI/9) with the purpose of implementing a strategy that could contribute to relieve poverty and favor a sustainable development, to strengthen capacities and to provide an appropriate and timely support, particularly to countries with underdeveloped economies and countries with economies in transition.

f. CITES (Convention on the International Trade of Endangered Species of Wild Fauna and Flora) (subscribed by Peru in 1992)

It is an international agreement subscribed by the state members. Its aim is to make sure that the international trade of wild animals and plants does not constitute a threat for their survival.

Similarly, the world trend is for certification as a mechanism which allows access to international markets such as the United States, Europe or Asia. Currently, they are the channels that encourage the companies of natural ingredients to improve their productive practices (manufacturing and processing). Institutions like the INIA, DIGESA and INDDA are now training future inspectors for the certification of good productive agricultural practices and processing of foods and medicines.
The most outstanding certifications for the sector are:

- Certifications of the product
- Technical Specifications (registry form) MSDS
- Organic
- Heavy Metals
- Certifications of the process
- Good Manufacturing Practice
- ISO 14001
- ISO 9000
- HACCP

It is also important to highlight the efforts that were put forth by the International Conference on Harmonization (ICH). It is a project in which the regulatory authorities and pharmaceutical experts of Europe, Japan and the United States examine the scientific and technical aspects of the sanitary registry of products. The purpose is to make recommendations to achieve a larger level of harmonization in the interpretation and application of the norms and technical requirements to register products. The idea is to reduce or obviate the need to carry out duplicate tests during research and the development of new drugs.

The agreements obtained by this conference are very important for Peru. Our country is a very well-known supplier of natural ingredients for medicinal and nutraceutical uses. The beneficial properties of these natural ingredients have to be demonstrated and accepted by the markets of the countries that participate in this project. Consequently, the agreements that are adopted will affect the future of the natural ingredients trade mainly especially those that are used for medicinal purposes.

VI.4 First Group of Selected Products

In order to prioritize the support activities of the sector, a preliminary list of 10 products has been selected from a larger group. The strategy foresees defining a final list chosen according to market criteria, interest by private-sector entities, readiness of raw materials, etc. Table 2 shows this preliminary list.

Table 2 First Group of Selected Products

PRODUCT	*SCIENTIFIC NAME*	*TARIFF*
1) Cats Claw Extract	*Uncaria tomentosa (Willd) DC*	*1302.19.10.00* *2106.90.90.90*
2) Maca Extract	*Lepidium meyenii Walp* *Lepidium peruvianum Chacon*	*1302.10.00.90* *2106.90.90.90*
3) Camu Camu Extract	*Myrciaria dubia (H.B.K) Mc Vaugh*	*2008.00.00.00*
4) Tara Gum	*Caesalpinia spinosa (Molina) Kuntze*	*1302.39.10.00*
5) Sangre de Grado Extract	*Croton lechleri*	*1211.90.90.90*
6) Muña Extract /Essential Muña Oil	*Minthostachys mollis (Kunth) Griseb*	*1211.90.90.90*
7) Rotenone Extract	*Lonchocarpus nicou L*	*1302.14.00.00*
8) Anthocyanin from Purple Corn	*Zea mays raza Kcully*	*3203.00.19.30*
9) Yacon Extract / Leaves	*Smallanthus sonchifolius*	*0714.90.90.00*
10) Sacha Inchi	*Plukenetia volubilis*	*1302.19.00.90*

Source: ADUANAS

Exhibits 1 to 20 include the Material Safety Data Sheets of 20 products that are considered in the study. Ten MSDS are from Table 2 and the rest are from a list of products proposed by the IPPN.

VII Performance of the Sector

Peru has an internal gross product (IGP) of around 55 billion US dollars per year. This figure includes exports which account for approximately 7 billion US dollars. These are divided into traditional exports (around 5 billion) and non-traditional ones (currently at around 2 billion). These exports are characterized by a certain degree of transformation and added value. This group includes exports of natural ingredients whose annual value is around 31 million US dollars.

VII.1 Production and National Trade

There is no official statistical information on the production and extraction of natural ingredients. However, it is known that Peru has around 20,000 producers, ecological and not ecological, distributed in 16 regions. There are around 50,000 hectares of intensive cultivation and 100,000 hectares of forests and natural grasses where the collection of natural resources is carried out and constitute the basis of the natural ingredients sector (National Commission of Ecological Producers, 2002). This is the size of the productive base and it is in permanent growth.

The performance of the companies producing intermediate and final natural products is affected by the following problems:

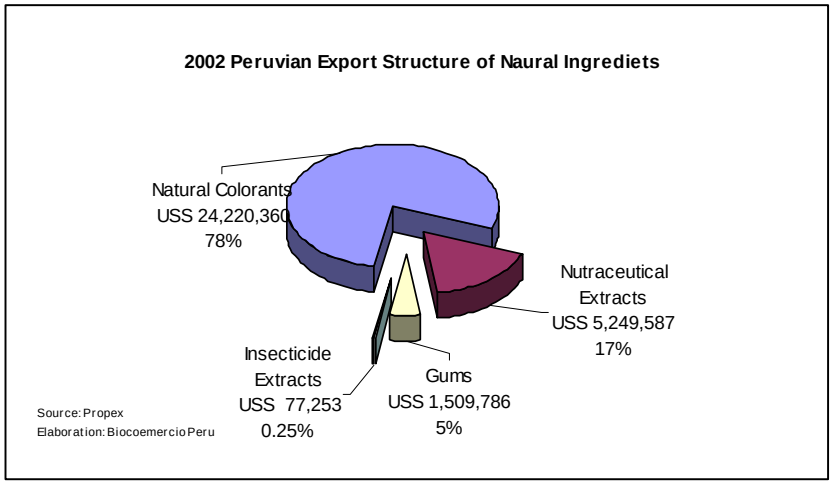
a. The supply sources are small and dispersed: The majority of agricultural producers are located on the coast and in the highlands. However, the forest has the largest amount of resources.
b. Information on the markets and the characteristics of the consumer is lacking.
c. They have serious deficiencies in their managerial skills.
d. They spend considerable effort and time coordinating with their suppliers.
e. They alternate formality with informality in their relationships with both suppliers and clients.
f. Most of them are not linked with economic agents, providers of foreign trade services and exporters.
g. Limited knowledge about how to become exporters and what skills should be developed.

An example of the great work carried out and to be performed to link with their suppliers is given by the enterprise "GRANOS ANDINOS" ("ANDEAN GRAINS"), a company which supplies the local market and cooperates with 12 different suppliers. These suppliers provide 42 types of products that come from 10 different regions from the coast, highlands and forest. It is obvious that the efforts in the coordination of supply, transportation and, of course, costs are very high. In spite of this, they have a steady growth in the national market.

VII.2 Natural ingredients Exports by Product Line in 2002

Chart 2 shows the FOB export values of the natural ingredients sector by product line in 2002. As it shown, the main export is the line of natural colorants whose total FOB value is $24,220,360, followed by nutraceutical extracts with a value of $5,249,587. The total FOB value of gums and natural insecticide extracts are $1,509,786 and $77,253, respectively.

Chart 2 NATURAL INGREDIENTS EXPORTS BY PRODUCT LINE, 2002



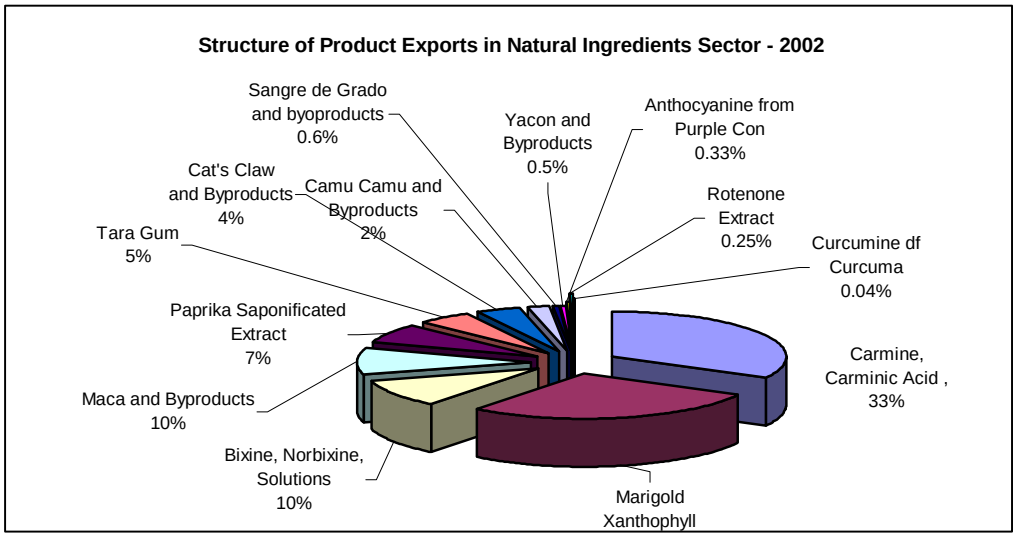
Natural colorants represent the largest share of natural ingredients exports with 78% due to the hard work done by Peru over the last 50 years. The nutraceutical extracts grew to a very significant 17% in 2002. This figure will continue to grow due to the current dynamics of the yacón and maca exports.

Table 3 Natural ingredients sector exports by product, 2002

Nº	Line of Products	FOB Valure (US)	Type of Ingredients
1	*Carmine, Carminic Acid, Solutions / E-120*	*10.167.062*	*Colorant*
2	*Marigold Xanthophyll / E-161b*	*8.645.385*	*Colorant*
3	*Bixin, Norbixine, Solutions/ E-160b*	*3.136.445*	*Colorant*
4	*Maca Extract and Byproducts*	*3.016.240*	*Nutraceutical*
5	*Paprika Saponificated Extract/ E-160c*	*2.162.447*	*Colorant*
6	*Tara Gum / E-417*	*1.509.786*	*Gums*
7	*Cats Claw & Byproducts*	*1.290.436*	*Nutraceutical*
8	*Camu Camu Extract and Byproducts*	*610.844*	*Nutraceutical*
9	*Sangre de Grado Extract and Byproducts*	*179.023*	*Nutraceutical*
10	*Yacon Extract and Byproducts*	*153.044*	*Nutraceutical*
11	*Antocianine Purple Corn / E-163*	*98.000*	*Colorant*
12	*Rotenone Extract*	*77.253*	*Insecticida Natural*
13	*Curcumine of Curcuma or Palillo / E-100*	*11.021*	*Colorant*

Source: PROMPEX Elaboration Biocomercio Perú

Chart 3 Natural ingredients sector exports by product



Source: PROMPEX *Elaboration: Biocomercio Perú*

Chart Nº 3 and Table 3 show that the carmine and carminic acid exports have the largest participation in the exports of natural ingredients with 33% of the total market and a value over 10 million US dollars, followed by xanthophyll marigold with 28% and a value of 8.6 million US dollars. In third place are bixine and norbixine with 10% of the market and commercial value of 3 million US dollars, followed by maca and saponificated extract of paprika, respectively 3 and 2 million US dollars, respectively. The tara gum and cat's claw have values of 1.5 and 1.2 million US dollars, respectively. Other natural ingredients have an FOB export values of less than 1 million US dollars.

VII.3 Development of Natural ingredients Exports under study

As it is indicated in Table Nº 4, the exports of Peruvian natural ingredients such as yacon, sangre de grado, maca and tara gum have steadily grown. The total exports of cat's claw and antocianines of purple corn have declined slightly and those of camu camu are fluctuating.

Yacon, due to its content of inuline and oligofructanes content, is being used as food supplement to reduce the risks of diabetes while sangre de grado is used because of its high external and internal healing properties. Both products are consolidating their presence in the international market of nutraceuticals. Maca is one of the most complete foods due to its high content of nutritious elements making it an effective revitalizer and an invigorating food. In spite of the problems of patents in United States and novel foods in Europe, maca continues to be the best product in this field. It is exported in the form of capsules, pills, tablets, sweets, extracts, flour, flakes, liquor, raw material maca and shampoos.

The export levels of cat's claw have probably decreased due to the barrier tariffs that have been adopted by some countries to restrict its imports, including the policies of novel foods in Europe. The exports of antocianines of purple corn have dropped by limitations of the market since it is only exported to Germany. This product is not sold in the United States because it does not have the approval of the FDA despite the fact that this product has been used in our country since immemorial times without any toxicity risk. Indeed, there are studies in Japan that indicate that the antocianines of the purple corn reduces the risk of colon cancer.

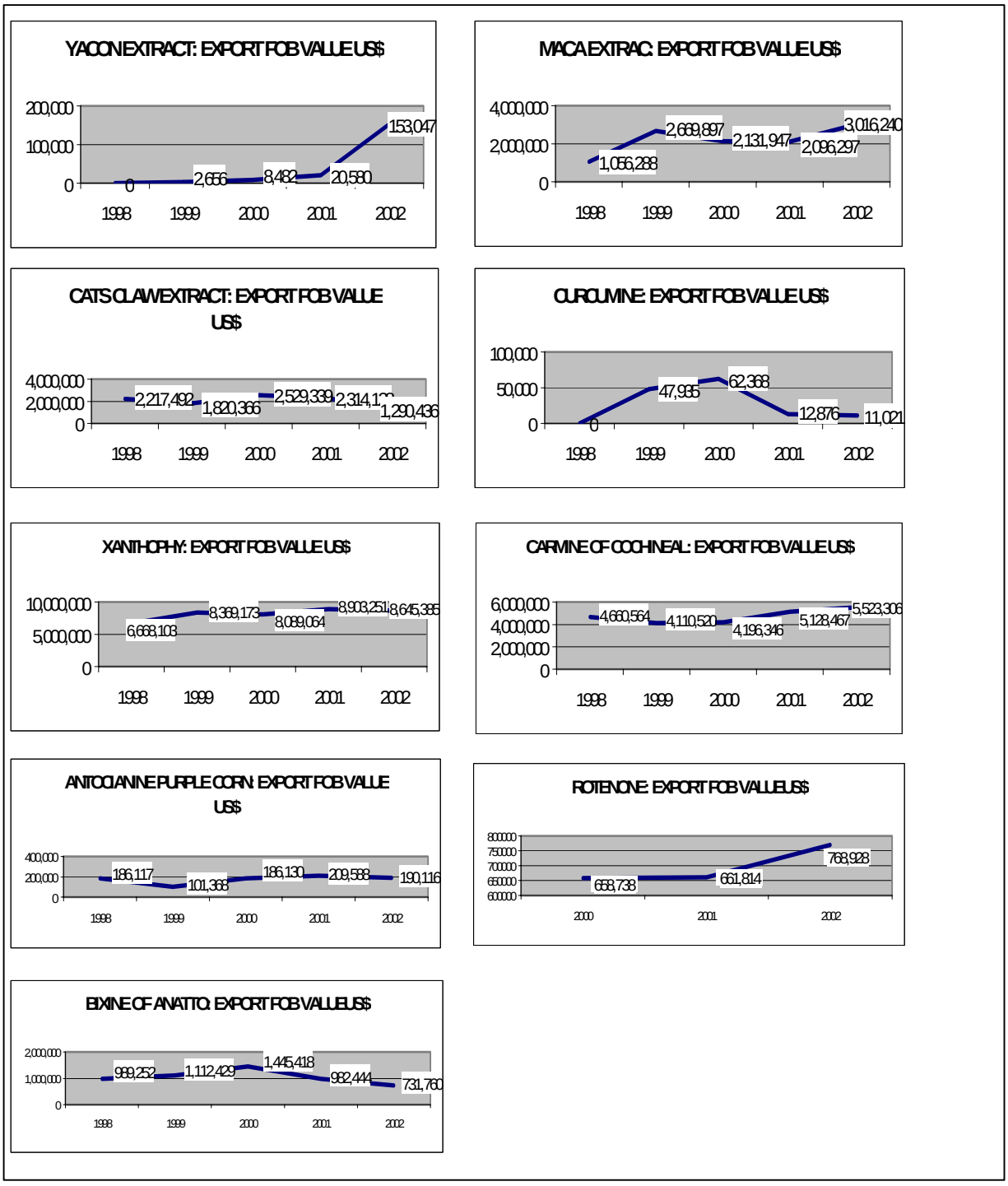
The tara gum exports are increasing due to its multiple uses. Tara gum can be used in the same segments of locust bean and guar gums. According to the World of Food Ingredients/ February - March 2001, the total market value of hydrocolloids is almost 3 billion US dollars. The market values of locust bean gum and guar gum are 110.0 and 97.0 million US dollars, respectively. Therefore, we can estimate that the growth of tara gum exports will likely be maintained.

Table 4 Raw Materials and Natural ingredients Exports, 1998-2002

Year	YACON EXTRACT	CATS CLAW EXTRACT	XANTÓFILA	ANTOCIANINE PURPLE CORN	MACA EXTRACT	CURCUMINE	PAPRIKA	COCHINEAL	ANATTO	TOTAL INGREDIENTS NATURAL
1998	0	2,217,492	6,668,103	186,117	1,056,288	0	1,180,720	4,660,564	989,252	16,958,536
1999	2,656	1,820,366	8,369,173	101,368	2,669,897	47,935	3,062,930	4,110,520	1,112,429	21,297,274
2000	8,482	2,529,339	8,089,064	186,130	2,131,947	62,368	5,897,005	4,196,346	1,445,418	24,546,100
2001	20,580	2,314,128	8,903,251	209,588	2,096,297	12,876	16,064,443	5,128,467	982,444	35,732,073
2002	153,047	1,290,436	8,645,385	190,116	3,016,240	11,021	19,425,627	5,523,306	731,760	38,986,938

Source: CUSTOMS. Elaboration: Biocomercio Perú

Chart 4 Natural ingredients Export Development

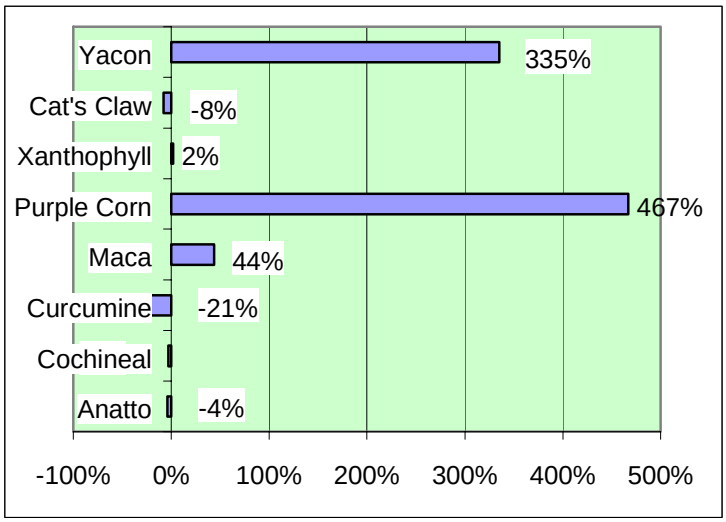


Source: CUSTOMS
Elaboration: Biocomercio Perú

As indicated in Chart 4, yacón, maca, xanthophyll, purple corn, cochineal and barbasco have a very positive export evolution with a growing trend, while cat's claw, curcumine and annato show a decreasing trend.

As indicated in Chart 5, during the five-year period from 1998 to 2002, the value of purple corn exports reached an average yearly growth of 467% despite the fact that it had a decrease of 9% in 2002. In addition, the price has almost doubled from $0.75 to $1.36/kg. Yacon has also shown a spectacular growth of 335%. It is important to emphasize the amazing growth achieved by purple corn in the German market supported by the studies carried out by Japanese researchers. These studies, as indicated previously, show the benefits of the antocianine of purple corn in fighting off colon cancer and the properties of yacón to fight diabetes. Paprika and maca also show significant growths of 181% and 44%, respectively.

Chart 5 Average Growth in Value of Natural ingredients Exports, 1998-2002



Source: CUSTOMS
Elaboration: Biocomercio Perú

VII.4 Market Analysis

VII.4.1 World Market Analysis

VII.4.1.1 Natural ingredients for the Pharmaceutical Industry

The world market of natural ingredients for pharmaceutical uses is around 360 billion US dollars. The sales have grown at a rate of 12% in 2001. The United States participates with 50% of this market followed by Europe with 24% (CBI Market Survey of July, 2002). The three largest markets in the world are the United States, Europe and Japan. The North American market has steadily grown at levels of 17% annually, while the Europan market has grown at levels of 10%.
According to the projections of the IMS, the world market of this sector grew in 2001 reaching an annual figure of 392 billion US dollars in sales of pharmaceutical products. The United States participated with a little more than 50% and Europe with 21%. In 2001, Europe had the market structure indicated in Table 5:

Table 5 Pharmaceutical Products Sales in the European Market, 2001

Pharmaceutical Products Sales in the European Market, 2001

2001			
Country	Sales	Participation	Growth Rate 2000 to 2001
	Thousands Millions in US$	(%)	
Germany	15.3	19%	7%
France	13.8	17%	4%
Italy	9.6	12%	9%
United Kingdom	9.4	11%	5%
Spain	5.7	7%	7%
Others	28.5	35%	-
Tot.	82.3	97%	

Source: IMS,2002. Elaboration: Biocomercio Perú

VII.4.1.2 Natural ingredients for the Herbal products Industry

The world trade of medicinal herbs is estimated in 9 billion US dollars annually with annual growth rates of 10%. The consumption of mineral vitamins and herbs in 2000 has been estimated at 38.5 billion US dollars. The main medicinal herb markets are located in Germany, China, Japan, the United States, France, Italy, United Kingdom and Spain. (Nutraceutical International, January 2001).

According to the magazine *Nutrition Business,* sales of medicinal herbs were 17.5 billion US dollars in 1999. Europe had the largest market with a participation of 38%. The leader

in this market was Germany with a market participation of over 50%, followed by France, the United Kingdom and Italy. The largest European markets (Germany and France) are consolidating while small markets show vigorous dynamism. In countries like Holland, buyers are not interested in raw materials but in vegetable extracts. These are found only in some underdeveloped countries that are willing to supply them according to the requirements of the western industry.
As Table 6 shows, the European market of medicinal plants represented a total of 3.16 billion US dollars in 2001. The two leading medicinal plants sold in Europe are gingko biloba and valerian.

Table 6 Medicinal plants with largest sales in europe, 2001

PRODUCT	*US$ millions*	*PRODUCT*	*US$ millions*
Gingko	*600*	*Butcher Broom*	*120*
Valerian	*300*	*Evening Primrose*	*110*
Horse Chestnut	*250*	*Pygeum*	*105*
Saw Palmetto	*230*	*Melilot*	*100*
Bitter Orange Extract	*220*	*Grape seed*	*90*
Garlic	*200*	*Milk Thistle*	*80*
Hawthorn	*140*	*Melissa / Toronjil*	*65*
Ginseng	*140*	*Nettle*	*60*
Psyllium	*125*	*Bilberry / Arandano*	*60*
Echinacea	*120*	*Chamomile / Manzanilla*	*45*
TOTAL			*3,160*

Source: Natural ingredients for Pharmaceuticals
EU Market Survey 2001
CBI / Centre for the Promotion of Imports from Developing Countries

VII.4.1.3 Natural ingredients for the Cosmetics Industry

The second line of products of the sector of natural ingredients sector is represented by those products that have cosmetic uses. This market represents 1.3 billion US dollars and it is constantly growing. At the moment, this sector includes over 20 categories of products for personal care including products for aromatherapy, baths, skin care, hair care and buccal hygiene.

The European Union is the largest cosmetic producer in the world followed by the United States and Japan. The largest producers in the European Union are the multinational companies UNILEVER (Holland), L´OREAL (France), WELLA (Germany), SANOFI (France) and BEIERSDORF (Germany). Many of them operate in a wide range of operations such as pharmaceutical, chemical and food industries and retail stores.

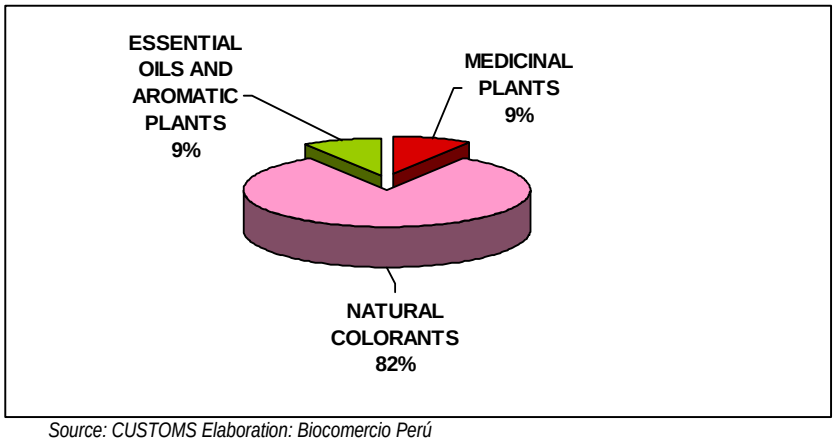
The natural products for personal care registered a market of 1.4 billion US dollars in 1996. In 1997 the figure registered grew to $2.8 billion US dollars..

In general, the annual average growth of the segment of natural products is estimated to be 8-10%. The natural component is more significant in some product categories even tough the definition of these products is changing among countries. The trend for cosmeceuticals is positive. Many underdeveloped countries are supplying natural ingredients for the cosmetics industry.

VII.4.2 Analysis of the National Market

Natural colorants are the main natural ingredients exported by Peru with a participation of 82% in the 56 million US dollar market. These are followed by medicinal plants and essential oils/aromatic plants. Both have market values of 6 million US dollars and market shares of 9%, as indicated in Chart 6.

Chart 6 Peru's Exports of Natural Products, 2002

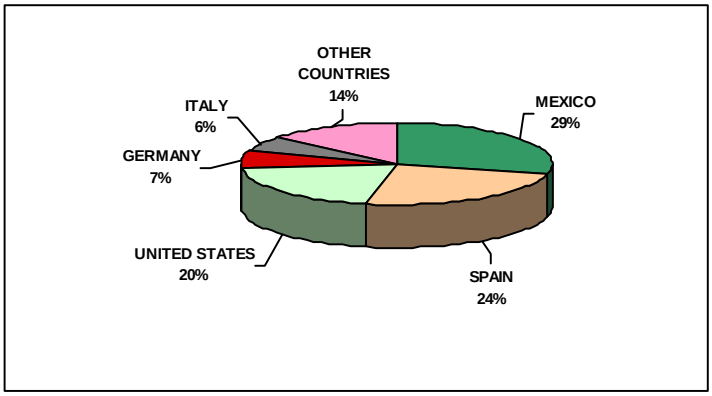


Source: CUSTOMS Elaboration: Biocomercio Perú

VII.4.2.1 Natural Colorant Market

During 2002, the exports of marigold, paprika, cochineal, anatto, purple corn and palillo represented a market value of 56 million US dollars. From this figure, 24 million US dollars corresponded to natural ingredients. Spain, Mexico and the United States were the largest importers with a participation of 29, 24 and 20%, respectively. These products were used in the cosmetic and food industries. In the last 10 years, we have observed a decreasing trend with the exception of purple corn and paprika with growths of 467 and 181%, respectively. These were the only natural colorants that performed well during this period.

Chart 7 Peru's Exports of Natural Colorants, by Market Destination, 2002



Source: CUSTOMS Formulation: Biocomercio Perú

VII.4.2.2 Essential Oils and Aromatic plants Market

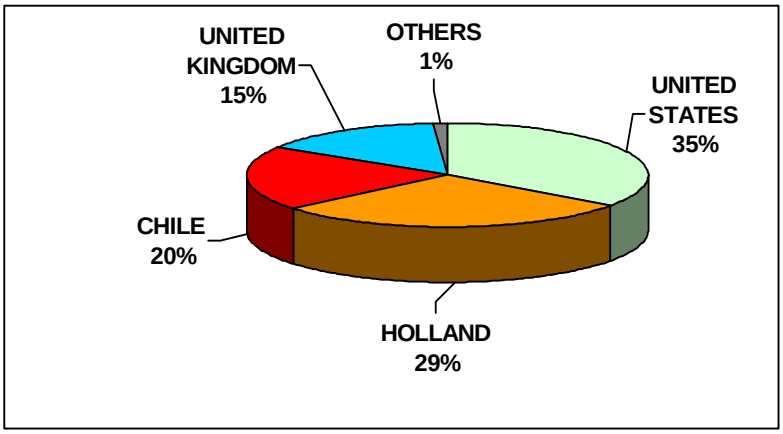
The main destination markets for essential oils and aromatic plans are the United States and Holland with 35 and 29% share of the market, respectively. Chile and the United Kingdom are behind with 20 and 15%, respectively. The main exports of this group of products are essential lemon oil and oregano with exports of 4 and 1.6 million US dollars, respectively.

For essential lemon oil, it is important to highlight a market growth of 7% in 2003 with respect to 2002. The main destination countries are the United States, Holland and the United Kingdom with market shares of 41, 35 and 18%, respectively.

For oregano, one can emphasize the favorable price evolution. As of June 2003, it has grown 32%, compared to the average price in 2002. The best prices are offered by US importers followed by those in Germany and Holland. The average price offered was $1.70/kg. However, the participation of these three countries only reached 8% of the total market. Chile leads this market with 63% of the total market with a price of only $0.60/kg.

It is important to emphasize the good performance of this sector with an export value growth of 7% in 2003 compared with the total exported during 2002.

Chart 8 Peru's Exports of Essential Oils and Aromatic Plants according to Market



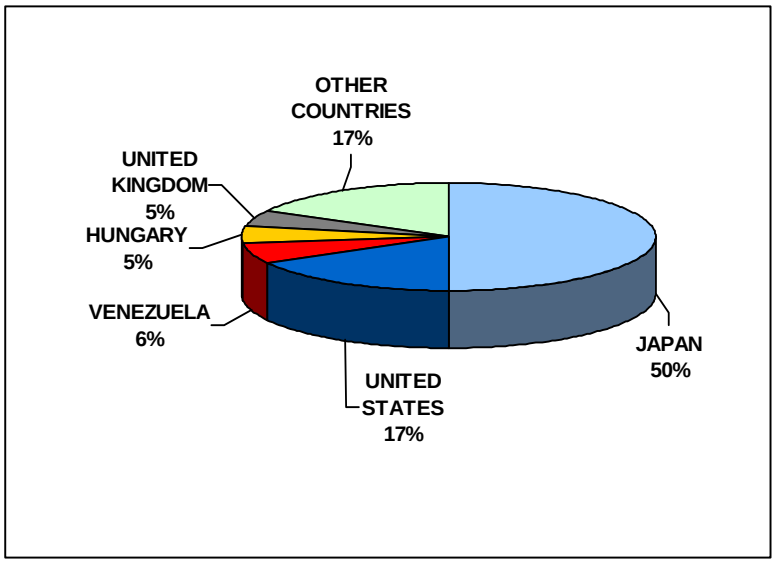
Destination, 2002

Source: CUSTOMS. Formulation: Biotrade Perú

VII.4.2.3 Medicinal Plants Market

The main destinations of the medicinal plants exports are Japon and the United States with share participations of 50 and 17%, respectively.
The products considered in this group are maca, cat's claw and camu camu with export values of 3.0, 1.3, and US 0.15 million US dollars, respectively.

Chart 9 Peru: Medicinal Plants Exports according toMarket Destination, 2002



Source: CUSTOMS Elaboration: Biocomercio Perú

VII.5 Main Problems with Export Performance

The main problems identified with the performance of private economic agents exporting to the international market of natural ingredients are listed below:

- There is a dual perception abroad. The group of colorants and essential oils has a reputation of reliability. The clients know the most responsible and efficient suppliers and they are loyal to them. On the other hand, in the case of new products or new suppliers, there is a feeling of distrut due to the nonfulfillment background and quality adulteration. The case of adulterated cochinilla is a good example of these problems. Bad exporters sold adulerated cochinilla below market price. They did not realize the negative consequences that this situation would create on importers.

- There is a lack of Material Safety Data Sheets in the exporting nutraceutical community. Their significance is not very well undertood.

- There are barriers that are limiting the Peruvian nutraceuticals exports. For example, patents in the United States or new international regulations with very high demands such as the regulation of new foods and medicinal plants in the European community. The FDA is asking for the implementation of good manufacturing practices in dietary ingredients and nutritious supplements. Industrialized countries are subsidizing their agriculture. Other countries of the Andean Community have larger exporting incentives than Peru.

- Discrepancies in quality. Most of the time, exporters send representative samples of products to potential buyers, prior to shipment. When the real product arrives to destination, there are discrepancies.

- There is a lack of quality control norms for natural ingredients.

- There is a lack of control mechanisms at Peruvian customs to avoid undervaluations in export prices.

- Non permanent exporters of maca and cat's claw. Companies enter and leave the market creating confusion in clients.

- The nutraceutical products enter the North American Market without any restrictions because they are considered nutritional supplements by the Food and Drugs Administration (FDA). Nutraceutical products should not include medicinal properties on their labels that have not been scientifically demonstrated.

Finally, we should indicate that this is a very difficult market. Exporters should know all commercialization aspects including the post-sale stage. Exporters should be able to consolidate and maintain their business. This is supported by the capacity of the different agents that participate in the productive chain reacting with speed and adapting themselves to changes that characterize these very demanding markets, both in time and in quality. We should be ready to build an effective productive chain with the support of all the organizations and institutions that are linked to this activity.

VIII Analysis and Assessment of the Sector

VIII.1 SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats)

a. STRENGTHS

- Peru is recognized worldwide as a supplying country of natural ingredients. The different microclimates of several inter-Andean valleys provide unique seasonal crops. Upon processing, they allow us to be the only suppliers in some market segments.
- State-of-the-art technology in natural colorants.
- High-quality products recognized worldwide.
- Stocks of endemic natural ingredients and available information on ethnobotanics.
- Ancestral knowledge in the handling of these resources.
- High development observed by organic farmers.
- Widely available land extensions for production.
- Yearly increase of 10% in natural colorants exports.
- Integration of companies of the sector in one entity (IPPN).
- Preliminary pharmacological research of aqueous and/or etanolics extracts.
- Appropriate legislation governing conservation and sustainable use.

b. OPPORTUNITIES

- Widespread worldwide trend towards natural products consumption.
- Consumers are aware of the importance of natural products for health and the environment.
- Possibility of a common position of countries offering natural ingredients in face of international regulations.
- Possibility of implementing modern marketing strategies (origin denomination and collective marks).
- Development of new technologies to overcome phytosanitary barriers in the United States, Japan and other Asian countries.
- Institutional support to optimize quality of products. Prompex supports exporters by means of Peru Biotrade Committee (Comité Biocomercio Peru).
- Formation of commercial and production associations, strategic alliances and joint ventures.
- International cooperation to carry out pharmacological and toxicological studies in standardized extracts.

c. WEAKNESSES

- Inability to cover demands in large quantities.
- Lack of standardized scientific information.
- There is a lack of a comprehensive research on the use and validation of results.
- The national agricultural production is not properly linked.
- Insufficient and heterogeneous national agricultural production.
- Lack of a national strategy that guides the activities of the main entities of the sector.
- The Peruvian Institute of Natural ingredients is in an initial growth phase.
- There are few specialized laboratories of chemical composition analysis.
- High production costs making the sector inefficient.
- Most producers have not implemented procedures of Good Manufacturing Practices (GMP), ISO systems and HACCAP.
- Not all the exporters of this sector can certify their products as organic due to the high cost of the certificate.
- There is little commercial information for products under study. The managers need statistical information as a technique to evaluate their markets and to determine if their products can enter into new markets.
- There is a legal gap in the normativity and regulation of natural ingredients processing.
- Very limited capacity of the INRENA, entity in charge of enforcing the legislation that rules sustainable use of natural resources.
- There is no process to identify the main basic productive and economic entities of this sector.

d. THREATS

- There is duplicity of roles and a growing number of efforts that lack coordination.
- Growing competition of other countries producers of natural ingredients.
- Countries under similar conditions "bluff" to have positions in these markets.
- Loss of markets for not complying with the high quality standards.
- Application of the Regulation (CE) No.258/97 of the European Parliament on new foods and new food ingredients (novel food)
- Approval of the new Regulation on Medicinal Plants (Directive 2001/83/EC).
- Tariff barriers linked to hygiene and quality conditions. (HACCP, ISO standards, GMS)

- Native natural products are sowed and patented in other countries.
- Larger industrialization in the processing of similar products that offered by other countries (acerola vs camu camu, sangre de drago vs sangre de grado).
- The presence of exporters known as "golondrinos" ("swallow") that enter and leave the market affecting the image of the Peruvian exporter.

IX Conclusions and Recommendations

IX.1 Conclusions

Peru is recognized worldwide as a supplying country of natural ingredients and leader in natural colorant exports. However, the strengths of the positioning of some products that have already conquered some the international markets have not been well-used. Most of interviewed companies have mentioned that there is a shortage of commercial, technical, scientific and of clinical verification information of the products under development.

There are elevated costs that limit the efficiency of the productive and commercial activities of the sector. An example is the high cost of shipment of samples, chemical, sanitary and mark certifications which limit the commercial promotion of the products and turns them expensive, and, therefore inefficient.

There is no regulation on good trading practices and managerial ethics. An example of this is the exports of micropulverized cat's claw and maca flour that have been labeled by some importers as adulterated products with other type of barks and flours. There is a worldwide trend for the consumption of natural products. However, there is a lack of training in techniques such as the Good Agricultural Practices and Good Manufacturing Practices.

A large number of entities in this sector do not have an "Ecological Conscience". They know the term "Sustainable Growth" only because it is being used by NGO's and development organisms.

The productive chain of the natural ingredients sector is in its initial development phase. Prompex is the organism that is trying to link the different economic agents in order to promote its growth. However, there are other entities that have not been well-used.

Finally, some entities that could cooperate with Biotrade and the BTFP Program have been already identified but still there is a lack of coordination to achieve an efficient cooperation.

IX.2 Recommendations

- In order to establish a National Program that shall allow sustainable use of the resources of the biodiversity and be able to develop the sector of natural ingredients, it will be necessary a strong sectoral association or entity which should be the first Institution to be strengthened with financial resources so that it will work in an independent way and in a close collaboration with Biotrade Initiative through its BTFP program. It shall also have the necessary resources to hire technical personnel to coordinate, manage and execute with its members the first natural ingredients biobusiness plans.

- It is necessary to prepare the market profiles for the 10 selected products including the MSDS so that interested companies would avoid problems to get access into the European Market.

- It would be advisable to centralize the commercial information, statistics, MSDS from competitors, MSDS of the products that are already in the international market, websites, specialized magazines or institutions related with nutraceutical products Then, the information could be available to interested parties. The information could be channeled through the Biotrade Committee / Prompex or the BTFP program .

- Next, there are some recommendations that have been grouped by specific aspects such institutionalism, strengthening the productive chain, technical assistance and fostering a managerial and environmental Culture:

IX.2.1 Institutionality

- It is necessary to support the strengthening of the IPPN as the main levering entity of the sector by supporting its organization and administration.

- In order to reduce costs, it is recommended to sign agreements for the analysis of natural products with reputable laboratories, institutions and universities.

- Is is necessary to create a favorable atmosphere for discussion between the entities or their representatives to feedback INRENA in the generation of legal aspectss that would start and motivate Biotrade activities by disseminating their potentials. Likewise, given the financial weakness of most companies, it is necessary the support of the BTFP program to provide a portfolio of organisms that could fund projects with biodiversity resources with sustainable handling so that they can be able to implement techniques such as ISO, HACCP and GMP.

- It is highly recommended to improve the communication between companies and institutions to solve problems of the sector. An effective feedback mechanism does not exist.

- It is necessary to increase the levels of transparency and trust in the management of institutions.

- It is necessary to promote an information system of raw materials suppliers where the characteristics of the product, quantity, price and other conditions can be found.

- It is suggested to develop effective mechanisms to improve the participation of each IPPN member.

- It is suggested to provide technical assistance for the formulation of projects that would provide international cooperation funds.

IX.2.2 Strengthening the Productive Chain

- It is necessary to strengthen the productive chain through the linkage of the entities (with emphasis in the formation of associations of producers).

- It is necessary to promote the collaboration between the entities of the state regarding the supplementary scientific and technological Information. A key entity could be the CONCYTEC.

- It is recommended to strengthen some entities especially those that have friendly productive practices with the environment. Some of these entities are already working with NGO's. It would helpful to have the participation of these NGOs. They would be in charge of promoting the good handling practices and social fairness. We can facilitate agreements or alliances between suppliers and exporters with the help of the NGOs.

- The development of technical capacities of producers is recommended. A training program and technical assistance is needed. It should offer technological and scientific knowledge to allow the development of useful skills that improve productivity.

IX.2.3 Technical Assistance

- It is necessary to promote the linkage between certifying companies and managers in order to promote access to certification mechanisms.

- It is recommended to facilitate cooperation mechanisms between scientific research institutions and entities such as the IPPN in order to focus the research towards concrete needs of the main managerial entities of the sector.

- It is necessary to promote the training in Good Production Practices- BPP and Good Manufacturing Practices- BPM.

- The implementation of the GPPs should be together with the support of managerial enterprises.

- A research and development agenda should be implemented by the IPPN.

IX.2.4 Fostering a Managerial and Environmental Culture

- It is recommended to increase the awareness of companies by means of alliances with productive entities in order to have a better knowledge of the environmental reality.

- It is necessary to get the assistance of the CBI in managerial projects to provide training in business plans and managerial ethics.

- It should be advisable to give talks or seminars to create an ecological conscience in the handling of biodiversity products. These talks should be directed to the national

enterprises, raw material suppliers, pickers of biodiversity products and other economic agents that participate in the productive chains of each product.

- It is necessary to continue with export training programs that have been carried out by the CBI during the last 10 years. These programs train companies in the fullfiling of necessary requirements in the export/import sector. Currently, the CBI has benefited 4 Peruvian companies and is evaluating to work with other companies. These companies should also take advantage of fairs and specialized events that PROMPEX promotes in coordination with the chambers of commerce of the countries where these events take place.

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EXHIBITS

EXHIBIT 1 TARA MATERIAL DATA SHEET

Name	***:***	*Goma de Tara en polvo*
English Name	***:***	*Tara Gum / Peruvian Locust bean gum*
Synonyms	***:***	*Goma de algarrobo peruano*
European Union Code	***:***	*E-417*

Description

Tara Gum is obtained after grinding the Endosperm of tara seeds, ***Caesalpinia spinosa (Molina) Kuntze****, after separating the skin from the germ.*

Active Principle	***:***	*Galactomananes gums*
Technical Specifications		
Appearance	*:*	*Fine powder cram to white color.*
Humidity	*:*	*Not more than 8 %*
Granulometry	*:*	*Mesh # 80, 100, 140*
Proteins (N x 6.25)	*:*	*Not more than 2.0 %*
Ash content	*:*	*0.08 % (Insoluble acid)*
Fat content	*:*	*Not more than 2.0 %*
Starch	*:*	*Absent*
Solubility	*:*	*Parcially soluble in cold water. Soluble in hot water. Insoluble in alcohol*
Viscosity at 20°C	*:*	*Not less than 3,000 cps.*
pH	*:*	*5.5*
Heavy Metals		
Lead(as PB)	*:*	*Not more than 20 ppm*
Arsenic (as As)	*:*	*Notmore than 3 ppm*
Microbiological Specifications		
Mesophiles aerobics	*:*	*Not more than 1,000 ufc / g*
Yeast	*:*	*Not more than 100 ufc / g*
Fungus	*:*	*Not more than 100 ufc / g*
Salmonella	*:*	*Negative / 25 g*
E. coli	*:*	*Negative / 10 g*

Uses:

For its high viscosity is used in food Industry as thickening agent and stabilizer in the preparation of powdered and liquid Soups, seasoning, Mustards, Ketchup, etc. It is compatible with other Gums which have a synergist action. (Locust rubber or garrofin, Guar gum, Xanthan gum).

In Cosmetic and Pharmaceutical Industry, in the elaboration of dietary products and for diabetics.

International Status

Approved by the European Union / AND-417 since 1990, it is equally recognized in Japan and in the USA. It is classified as GRAS (Generally Recognized as Safe).

TARA AND BYPRODUCTS

Tara is a wild tree, native of Peru which fruit is a sheath (Leguminous Family) that it collected when it is dry, mature and reddish; it is used to harden leathers. The white color given by the tannin from Tara to leather is very appreciated to obtain different shades, when it is combined with other tannins.

Common Namer	***:***	*Tara, Taro, Taya*
Scientific Name	***:***	*Caesalpinia spinosa (Molina) Kuntze*
Active Principle	***:***	*Tannins*
Production Areas	***:***	*Departaments of Ayacucho, Cajamarca, La Libertad, Huanuco, Apurimac, Ancash, Arequipa, etc.*

Uses of Tara and its Byproducts

Tara in shaft	*:*	*In infusion (Tara tea), gargles for the throat, cough, colds*
Tara in powder	*:*	*Tanning industry, Chemical Industry to obtain Tannic Extract Tanic acid, Gallic acid. Pharmaceutical Industry, Cosmetics,, Textile, etc.*
Tannin Extract	*:*	*leather industry (Tara in micropulverized powder Mesh 300)*
Tanic Extract	*:*	*leather Industry.*
Tanic Acid		*Food Industry (Clarify agent in wine, beer and food manufacturing Photograph, Paper Industry, etc.*
Gallic Acid	*:*	*Pharmaceutical Industry for the production of Trimethoprim, antibiótic base of Bactrim. I the manufacturing of pyrogalol,writing inksr, engraving process and lithography, analytic reactive, etc.*
Propyl Gallate	*:*	*Antioxidant for Food industry, prevents oil and fats oxidations Combine well with BHT and BHA.*
Tara gum	*:*	*Food Industry (Replaces Locust bean y Guar gums) Cosmetic industry, Textiles, Paper, Explosives, Paints, etc. Has synergy action with Xanthan gum.*
Tara protein	*:*	*Food Industry (Flour for breads and cookies)*

Tariffs

Tara seeds	*:*	*1209.99.10.00*
Tara gum	*:*	*1301.90.90.00 (European Union Code : E-417 / USA : GRAS)*
Tara powder	*:*	*1404.10.30.00*
Propyl Gallate	*:*	*2918.29.12.00*
Gallic Acid	*:*	*2918.29.19.00*
Tanic Acid	*:*	*3201.90.90.00*
Tanic Acid	*:*	*3201.90.90.00*
Tanning Extract	*:*	*3202.90.90.00*

Tara Competence	***:***	*Nuez de Agallas o Gall / China (Nutgalls)* *Quebracho / Argentine, Uruguay, Paraguay* *Mimosa / Brasil, Kenya, Southafrica,England* *Castaño / Italya, France, USA,Spain, España, Swiss* *Zumaque / Italy, Spain, India* Oak tree and pine tree / Austria, Germany

EXHIBIT 2 CAT'S CLAW MATERIAL DATA SHEET

Name **:** ***Uña de Gato***
Scientific Name : Uncaria tomentosa (Willd) DC

Description
Cat's claw is a climber liana of the Family of Rubiáceos which habitat is in the Peruvian Amazonía, between 200 to 800 meters above sea level. It is a tropical species broadly distributed in the central Forest area (Chanchamayo, Satipo, Oxapampa, Codo del Pozuzo, Valley of the rivers Pichis, Palcazu and Pachitea, national Forest Alexander Von Humbolt), and in San Martin and Madre de Dios departmentsother of God.

Active principle
Alkaloids, Isoteropodine / Uncarina E,, Pteropodina / Uncarina C, Isomitraphiline / Ajmalicina – Oxindol A, Mitraphiline, Isorinchophiline, Rinchophiline, Uncarine F, Speciophiline / Uncarine D.
Quinovic acid, Glycosides, Flavonoids, Tannins, Vitamins and Minerals (calcium, phosphorus, magnesium, potasium, sodium, manganese).

Características sensoriales

Appearance	:	Fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic

Physical/chemical Characteristics

Humidity	:	Not more than 8 %		
Preservatives	:	Absent		
Pesticides	:	according to FDA standards		
Antioxidants	:	Absent		
Heavy Metals	:	Lead (as Pb)	:	Not more than 10 ppm
		Arsenic (as As)	:	Not more than 3 ppm

Microbiological Characteristics
Mesophiles aerobics: Maximum 1,000 ufc / g Fungus and yeasts: Maximum 100 ufc / g
E. coli : Negative : 10 / g Salmonella : negative : 25 / g

Uses
Food complement that favors anti-inflammatory activity. could prevent illnesses asprostatitis, ulcers, diabetes, diarrheas and relieves pains produced by sciatica and lumbago. Fights off rheumatic, arthritic ailments and certain epidermic illnesses.
It strengthens immune system and therefore prevents organic deterioration that leads to premature aging and many illnesses. For asthma treatment, allergies, acute and chronic viral infections; has anti-oxidant properties and antimutagenics (it blocks alteration of genetic message of cells) and helps to prevent cells to become cancerous.Prevents proliferation in vitro of certain harmful tumors as the one in mammary glands. would have antitumoral alkaloids that neutralizes in about 50% leukemia cells . Does not have any toxicity degree.

THERAPEUTICS DATA SHEET

Name **:** Uña de Gato (cat's claw)

Scientific Name : Uncaria tomentosa (Willd) D.C.

Common nameas: " Zavenna rossa ", " quitabultos ", uncucha, garabato, gara-bato colorado, garra gavilan, jipotatsa, kug kukjaqui, michomentis, paotati-mosha, samento, toron, tsachik, unganangi.

Part of the Plant used : Bark

Therapeutic Use **:** It has an effective anti-inflammatory action, exerts beneficial action regulating immunologic mechanisms which in certain circumstances could inhibit the growth of cancerous cells .

Uses

Food supplement. Favors anti-inflammatory activity.

Could prevent illnesses as prostatitis, ulcers, diabetes, diarrheas and reliefs pains caused by sciatica and lumbago.

Strengthens immune system and prevents organic deterioration that cause premature aging and many illnesses.

For asthma treatment, allergies, acute and chronic viral infections.

Prevents cancer. Has anti-oxidant and anti-mutagenic properties (it blocks the alteration of genetic message of the cells) and prevents cells to become cancerous.

Prevents proliferation in vitro of certain harmful tumors as the one in the mammary glands.
Could have antitumoral alkaloids that neutralize iaround 50% of leukemic cells .
Fight off rheumatic, arthritic ailments and certain epidermal illnesses.
Does not have any toxicity degree.

EXHIBIT 3 MACA MATERIAL DATA SHEET

Name	***:***	***Maca***
Scientific Name	:	Lepidium peruvianum Chacon Lepidium meyenii Walp

Description

Maca is originary from Central Andes of Peru, the Departments of Pasco and Junín. It is found in certain Communities located in the Meseta de Bombón, between the 4,000 and 4,300 meters above sea level. It is a herbaceous species, tuberous root, Family of the Crucíferas that have the appearance of a spinning top.

Active Principle

It contains Alkaloids, Aminoacids, Flavonoids, Glucosides, Saponines, Complex B Vitamins, Natural Strogens and Minerals as Calcium, Iron and Zinc.

Sensory Characteristics

Appearance	:	Fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic

Physical/Chemical Characteristics

Humidity	:	Not more than 8 %		
Preservatives	:	Absent		
Pesticides	:	According to FDA standards		
Antioxidants	:	Absent		
Heavy Metals	:	Lead (as Pb)	:	Not more than 10 ppm
		Arsenic (as As)	:	Not more than 3 ppm

Microbiologic Characteristics

Mesophiles aerobics	:	Maximum 1,000 ufc / g
Fdungus and Yeasts	:	Maximum 100 ufc / g
E. coli	:	Negative : 10 / g
Salmonella	:	Negative : 25 / g

Uses

Nutritional food, very effective against malnutrition and convalescence.
Dietary supplement for women, men and for high performance sportsmen.
Helps to regulate menstrual cycle and improves menopause symptoms. It favors feminine fertility. Suitable for cases of sterility, frigidity and sexual impotence. Improves the quality of sexual life in man and woman.
Reestablishes corporal and intellectual capacity. Improves concentration and memory. Is used in surmenage, inappetence and anemia. It fights-off insomnia and mental fatigue.
It fights-off resiratory illnesses, rheumatic affections, arthritis and lost of calcium in the bones.

In geriatrics it could be used in symptoms of senile involution, nervousness and mental deficit.
Contraindicated for high blood pressure people and pregnant women .

THERAPEUTIC DATA SHEET

Name	:	Maca
Scientific Name	:	Lepidium peruvianum Chacon Lepidium meyenii Walp
English Name	:	Maca
Common name	:	Huto, Ginseng peruano, Ginseng andino, Dr. Macasi, Willku, Chichira
Part of the Plant used	:	Root

Therapeutic Use ***:*** Reactivates cellular metabolic process, recovers organism and at the same time strengthens physical and psychic performance. Tonic, rejuvenates, revitalizes, invigorates and anti-stress. Stimulates brain functions and reproduction organs.

Uses
Nutritional food. Use, fresh or dry, parboiled or roasted, whole or milled, alone or accompanied.

Very effective to fight-off malnutrition and for convalescence.

Dietary supplement ideal for men, women and high performance sportsmen.

Helps to regularize menstrual cycle and improves menopause symptoms .

Favors feminine fertility.

Suitable for cases of sterility, frigidity and sexual impotence. Improves the quality of sexual life in man and woman.

Reestablishes corporal and intellectual capacity, improves concentration and memory. Used in surmenage, inappetence and anemia. Fights-off insomnia and mental fatigue.

Figth-off respiratory deseases, rheumatic affections, arthritis and lost of calcium in the bones.

In geriatrics could be used in senile involution symptoms, nervousness, mental deficit.

EXHIBIT 4 CAMU CAMU MATERIAL DATA SHEET

Name	:	Camu Camu
English Name	:	Bayberry, Rumberry, Guavaberry, Camu Plus.
Scientific Name	:	Myrciaria dubia (H.B.K.) Mc Vaugh
Common Name	:	Camu Camu
Origen	:	Loreto
European Union Status:		E-300 / Vitamine C Natural / Ascorbic Acid

Description

It is a bush of 6 to 8 m of height, native of some Peruvian tributaries of the river Amazons It has a spherical fruit of 10 to 32 mm of diameter, pink color that varies to dark red . It is soft. In wild state Camu Camu grows in the bank of the rivers, part of the trunk submurged in water to a height of 30 to 40%, of its total length. The season for its crop is in the months of December to March.

Composition and chemical analysis of Camu Camu (Instituto de nutrición 1,957)

a. (Content of 100 gms., eatable parte)

Mayor Components (gms)		Minerals (mgs)
Calories	:	16
Calcium	:	28
Water	:	93.2
Phosphurus	:	15
Proteines	:	0.5
Iron	:	0.5
Fats	:	0.0
Carboydrates	:	4.0
Fiber	:	0.5
Ashes	:	0.2
Vitamines (mgs)		
Carotene	:	0.00
Thiamine	:	0.01
Riboflavine	:	0.04
Niacin	:	0.61
Reduced Ascorbic Acid	:	2089.0 (*)

USES

The pulp of Camu Camu is used in the elaboration of Juices, Nectars, Yogurts, Ice creams, Marmalades, Jellies and Alcoholic or Not Alcoholic Drinks (Sodas). For its high content of Ascorbic Acid or Natural Vitamin C is used in the preparation of Exotic Juices, mixing it with Juices from other tropical fruits. The pulp of Camu Camuis either dehydrated by Liofilization or Atomization. it can use in the elaboration of Capsules, Pills or Natural Vitamin Cpills. To fortify drinks for sportsmen, nutraceutical type as Citrus punch, fruit Drinks, etc. Also to fortify dairy products as Yogurts, Ice creams, etc.

(*) According to Perú Amazon Export S.A.analysis, in the Laboratorios Michelson / USA, the content of Ascorbic acid in 100 grs of the eatable part was of 2,634 mg

THERAPEUTIC DATA SHEET

Name : Camu Camu / Natural Vitamine C

Scientific Name : Myrciaria dubia (H.B.K) Mc Vaugh

English Name : Bayberry, Rumberry, Guavaberry, Camu plus

Common Name : Camu Camu

Part of the Plant used : Fruit

Therapeutic use : As Natural Vitamin C, favors the formation of the collagen, protein that sustains many corporal structures and forms bones, teeth, gums, blood vessels and skin. It can stimulate natural defenses of the organism and intervenes in the absorption of the iron from vegetable foods. Scurvy is the classic manifestation of serious lack of ascorbic acid or Vitamin C.

Uses

Food supplement. ANti-oxidant . It increases the defenses of the organism. Stimulates Inmune system and antibacterial. It prevents infections and prevents scurvy.

Intervenes in the formation of teeth, bones and conjunctive tissues. Capillar fragility, hemorrhage, malformation of bones and teeth.

Helps avoid fatigue, important for the formation of muscles, tendons and ligaments. Essential for the absorption of iron Prevents Sportsman's Anemia)

Exerts a preventive and therapeutic action of the cellular aggression due to oxidation by radicals, in ocular illnesses as macular degeneration related to age and cataract.

Diets with good amount of Vitamin C is important for children, pregnant women or women that are breast geeding and people of the third age.

EXHIBIT 5 MUÑA MATERIAL DATA SHEET

Name	:	Muña
Scientific Name	:	Minthostachys mollis (Kunth) Griseb Minthostachys setosa (Briq) Epl
Common Name	:	Muña
Part of the Plant used	:	Leaves, flowers and stem.
Therapeutic use	:	Digestive, Carminative, and for the stomach.

DESCRIPTION
It is a bush of the Family of Labiadas native of the Peruvian highland that has a height of 0.80 mts., to 1.20 mts., It grows at 2,500 to 3,500 m.a.s.l.
This bush is leafy in the superior part; straight and pubescent. Its stem is branched from the base and it has small, sawed leaves. Its flowers are white and gathered in short clusters.

COMPOSITION AND CHEMICAL ANALYSIS OF DRYED MUÑA (Tablas Peruanas de Composición de Alimentos. 1996-Peruvian Tables on Food Composition 1966)
(Content ien 100 grs., eatable part)

Mayor Components (grs)		
Energy	:	299.00 (kcal)
Water	:	16.00
Proteines	:	3.20
Fats	:	2.80
Carbohydrates	:	66.30
Fiber	:	9.40
Ashes	:	11.70
MINERALS (mgs)		
Calcium	:	2,237.00
Phosphurus	:	269.00
iron	:	22.40
VITAMINES (mgs)		
Retinol	:	306
Thiamine	:	0.35
Riboflavin	:	1.81
Niacin	:	6.85
Reduced Ascorbic Acid	:	0.00

USES
Muña is used as infusion because of its carminative and stomach properties. It is an excellent digestive, after rich foods. It has a slight mint flavor that makes it very pleasant, when served as tea. It is used as condiment and its leaves are used to cure fractures, dislocations and tumors caused by blows.

Due to its high content of Calcium (4.7 times more than Maca), it could be a good food complement since it favors growth and is good for bones and teeth. It also favors the

nervous system, and prevents osteoporosis, and recovering from bone fractures. Prevents decalcification of bones and teeth in men and women. The lack of Calcium produces dental cavity and rachitism. It also has a high content of phosphurus that strengthens the hardness of bones and teeth, besides favoring blood clotting. Prevents the osteomalacie or softness of bones. Its content of iron favors the formation of red globules and prevents anemia.

EXHIBIT 6 LECHE DE OJE MATERIAL DATA SHEET

Name : Licin
Scientific name : Ficus anthelmintica
Common name : Leche Oje

Description
Its a proteolytic enyme obtained from tropical trees latex of the genus Ficus (Ficus anthelmintica, Ficus glabrata, Ficus sp). In our Amazonian jungle is known as Leche Ojé.

Active Principle
Proteolytic enzyme

Technical Specifications

Appearance	:	Liquid, cream color
Odor	:	Characteristic
Solubility	:	Soluble in water insoluble in common organic dissolvents .
pH	:	5.5 (optimum proteolytic activity)
Inactivity	:	With oxygenated water or Iodine the licin is inactive

Uses
Licin is used in the elaboration of pharmaceutical products because of its antithelmintic properties which fights-off all types of intestinal parasites; it acts mainly as purge by ingestion.
In the United States of North America, it is used as meat tenderizer of meats and modifier of proteins.
Since its use is similar to those of Papain, the Licin is also used as clarifier in the Brewer Industry..
In the Dairy Industry is used to elaborate cheese and substitutes rennet.
In the Industry of the Leather the proteolytics enzymes are used to eliminate hair.

Storage
Keep in their original containers, tightly closed. Refrigerate at 3°C at 5°C. Under these conditions their period of life is of 1 year.

EXHIBIT 7 CAIGUA MATERIAL DATA SHEET

Name	:	Caigua
Scientific Name	:	Cyclanthera pedata L
Common Name	:	Achojcha (Quechua), Pepino hueco Kaikua (A-guaruna)

Active Principle
Steroid and Triterpene, Coumarin, Tannin and Phenols

Description
Caigua is an annual climber herb native of Peru that belongs to the Family of the Curcubitaceas. Caigua is cultivated from ancestral times and is used raw or parboiled.

Composition and Chemical analysis of Caigua (Peruvian Tables on Food Contents, 1996), Content in 100 grs., of eatable part :

Mayor Components (grs)		
Energy	:	15.00 (cal)
Water	:	95.00
Proteines	:	0.50
Fats	:	0.20
Carbohydrates	:	3.30
Fiber	:	1.60
Ashes	:	1.00
MINERALS (mgs)		
Calcium (Ca)	:	34.00
Phosphorus(P)	:	43.00
Iron (Fe)	:	0.90
VITAMINES (mgs)		
Retinol (mcg)	:	9.00
Thiamine	:	0.02
Riboflavin	:	0.02
Niacin	:	0.17
Reduced ascorbic Acid	:	11.40

Uses
Food supplement. It could reduce levels of cholesterol (reducing the levels of LDL-cholesterol in the blood, eliminates one of the high risk factors of heart attack in the myocardiumo) relief in cases of high blood pressure. Antidiabetes and Diuretic. Is useful in treatments to lose weight. Caigua Leaves : Anti-inflammatory. Caigua seeds: Purgative and Vermifuge

EXHIBIT 8 YACON MATERIAL DATA SHEET

Name **:** Hojas de Yacon
Scientific Name : Smallanthus sonchifolius
Common Name **:** Llacon, lajuash, aricoma o aricona, yacuma (Ecuador), jicama (Colombia), jiquimilla (Venezuela).

Description
Yacon is a species of the family Asteraceae (Compositae). Native bush of the highlands. Domesticated by the tahuantinsuyana population. Known by the prehispanic Peruvian population for the sweetness of its large roots and concentrates its anti-diabetes principles on its leaves.

Active principle
Proteines, Inulin, Sugars, (Fructuose, Glucose, Saccarose), Minerals (Calcium, Phosphorus,and iron)

Composition and chemical analysis of Yacon (Composition of Peruvian Food/Nutrition Institute 1957). Content in 100 grs eatable part:

1) Mayor Components		
Water	:	86.60
Proteines	:	0.30
Fats	:	0.30
Carbohydrates	:	10.50
Fiber	:	0.50
Ashes	:	0.30
Calories	:	63
2) Vitamines		
Carotene	*:*	*0.08*
Tiamin	:	0.01
Riboflavine	:	0.10
Niacin	:	0.33
Ascorbic acid	:	4.10
3) Minerals (mgs)		
Calcium (Ca)	:	23.0
Phosphorus (P)	:	21.0 I
Iron (Fe)	:	0.3

Uses
Food supplement. Food low in Calories and Fats, ideal for people that are on diets to loss weight. It has anti-diabetes properties. It relieves gastrointestinal problems, kidneys and skin rejuvenator. Tea with yacon leaves reduce the content of glucose in the blood.

EXHIBIT 9
CHUCHUHUASI MATERIAL DATA SHEET

Name	**:**	Chuchuhuasi
Scientific Name	:	Maytenus laevis
Common Name	**:**	Chuchuhuasca, Chuchuwasa

Description
Chuchuhuasi is a high tree of 30 mts., approximately. It belongs to the Family Celastraceas that is characterized for its long leaves of 10 to 30 cms, small white flowers and very hard reddish brown bark .

Principio activo
Alkaloids, “Catechines”, Flavonoids, Quinones, Cumarines, Phenols, Saponines, Tannins, Organic Acids, etc.

Technical specifications

Appearance	:	Product in fine powder
Color	:	Characteristic (light brown)
Odor	:	Characteristic
Flavor	:	Characteristic (Bitter)
Heavy metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiologic Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeaasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
Food supplement. Tonic, Anti-artritis, anti-inflammatory of bones and joints. , Aphrodisiac and Analgesic Relajante. It counteracts hepatic problems and renal inflammations.Muscular sedative. Acts against impotence and menstrual disorder . In Brazil and Italy is under study to fight-off skin cancer.

EXHIBIT 10 SANGRE DE GRADO MATERIAL DATA SHEET

Name	**:**	Sangre de Grado
Scientific Name	:	Croton lechleri
Common Name	**:**	Sangre de Dragon, Shawan karo (Shipibo), Palo Grado, Pocure, Racurana.

Description
Sangre de grado is a resinous latex extracted trees of genus Croton that iare found in the forest areas of Peru in the departments of Loreto, San Martín, Amazonas, Huanuco, Ucayali, Cuzco, Madre de Dios y Puno.

Active principle
Alkaloids as taspine, crotonic acid, antitumoral alkaloids (piridone), antraquinones, non-saturated fat acids, triterpenes, tannins, benzoic acid, etc.

Technical Specifications

Appearance	:	Producto in fine powder
Color	:	Characteristic (redish brown)
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
sangre de grado due to its high content of Taspin, accelerates the healing processes of external and internal wounds as well as ulcers. It is astringent, hemostatic, antiseptic, depurative, regenerator of muscular tissue. It eliminates renal stones, illnesses of the bladder, urethra and prostate.

EXHIBIT 11 CHANAPIEDRA MATERIAL DATA SHEET

Name	**:**	Chancapiedra
Scientific Name	:	Phyllantus niruri
Common Name	**:**	Sasha foster, Quebra pedra, Tamalaka

Description
Chancapiedra is a small bush that grows to a height of 30 to 60 cms., native of the Peruvian Forest it has a straight stem and alternate leaves of 7 to 12 cms, Inside the shaft its fruits are 2 to 3 mm in diameter.

Active Principle
Alkaloids, steroids, flavonoids, triterpenes, terpenes, lignans, Methyl Salicylate, tannins, vitamin C, lipids (linoleic acid, linolenic acid, etc.), carboxilic acid, astralgine, nirantine, nirurine, etc.

Technical Specifications

Appearance	:	Product in fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
Chancapiedra is effective in the treatment of renal stones and hepatic illnesses. Specif muscular relaxation in the urinal and billiar tract to facilitate the expulsion of bladder and kidney stones. It has an antiviral activity to Hepatitis B. It has disinfectant action for the digestive system. acts on urogenital infections, venereal deseases, mouth infections and throat, jaundice, diabetes, dysentery, etc.. Anti-oxidant, Anti-inflammatory in gastrointestinal dysfunctions.

EXHIBIT 12 PASUCHACA MATERIAL DATA SHEET

Name	**:**	Pasuchaca
Scientific name	:	Geranium dielsianum Knuth
Common name	:	Pasuchaca

Description
Perennial plant with typical root or pivot. Basal pubescent leaves sustained by petioles of 21 mm long. Umbel Inflorescence, peduncle, floral of 10 mm long. It has an esquizocarpic fruit .

Active Principle
Reducers sugars, glicosides, saponines, gomas, mucilages, flavonoids, carotenoids, tannins, etc.

Technical Specifications

Appearance	:	Product in fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detección E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
Is a powerful Antidiabetes, hypoglycemiant and blood purifier in pancreatic dysfunctions. It has astringent properties that fights-off chronic diarrheas, infantile cholera, hemorrhage, throat inflammations and buccal ulcers.

EXHIBIT 13 HERCAMPURI MATERIAL DATA SHEET

Name	**:**	Hercampuri
Scientific Name	:	Gentianella alborosea (Gilg) Fabris
Common Name	**:**	Hircampuri, Hilcampure Te amargo, Te de Chavin

Description
Native plant of Peru that grows in the Andean Regions at 3,500 to 4,300 m.a.s.l. in areas with very cold climates and high punas in Puno, Cuzco, Cerro de Pasco, Ayacucho, Cajamarca.

Active Principle
Glucosidic type bitter substances as amarogencine and Genciopicruna. alkaloids, saponines, tannins, resins, hemicelulose, minerals (aluminium, calcium, potassium, magnesium, sodium and chlorine), etc. eritaurine.

Technical specifications

Appearance	:	Producto en polvo fino
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
It has hepatoprotection, detoxify and depurative properties. It is hypoglycemiant (Diabetes) and Diuretic. It is useful in the treatment of hepatic vesicle and pancreas ailments. It is effective to lower the cholesterol and diminish obesity. From the Inca times it has been used to relief stomach pains and fevers caused by malaria.

EXHIBIT 14 SOURSOP LEAVES MATERIAL DATA SHEET

Name	**:**	Hojas de Guanábana
Scientific name	:	Annona muricata L
Common name	**:**	Cohossol, Zapote agrio, Araticu – penhe, Graviola (Portugués)

Description
Soursop is a low tree of 6 to 8 mts., high, compact foliage and conaceas and brilliant leaves. It grows at 1,000 mts., Does not resist very well to cold and wind. The fruit is similar to Cherimoya and measures 14 to 30 cms., long and 12 to 15 cms., wide; dark green color; the pulp is white and juicy.

Active principle
Alkaloids, (Annonaceous Acetogenins), Muricoreacin, Munhexocin C, Mono-tetrahydrofuran acetogenins, Annomuricin E, Miricapentocin.

Technical Specifications

Appearance	:	Product in fine powder
Color	:	Characteristic
odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercuryo	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	**Not more than** 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
The Leaves of soursop haveanti-tumor properties It is Anti-cancerigen (Prostate). it is also used as anti-spamodic, sedative, asthma, hypertension, diabetes, disorder of the liver, diarrhea and against parasites (Lice).

EXHIBIT 15 ANATTO MATERIAL DATA SHEET

Name	**:**	Anatto leaves
Scientific name	:	Bixa orellana L
Common name	**:**	Achote, Onoto, Urucum, Rocu

Description
The anatto is a low tree which fruit is a dehiscent capsule (red or green) that opens up in two 2 valves that contain approximately 30 to 40 seeds. It has alternate leaves, peciolate, elliptic, conniforms in the base and hairless in both faces. It has large violet flowers.

Active principle
Alkaloids, bixagameno, bixine, fenilanine, salycidic acid, triptophane, elagic acid, treonine, tannins, saponines and carotenoids.

Technical Specifications

Appearance	:	Product in fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Usos
The anatto leaves have anti-inflammatory properties and are used to relief the Uro-genital system and to prevent prostatic growth . They also lower the cholesterol, arterial hypertension, eliminates uric acid and cystitis. It helps in the treatment of renal inadequacy, prolapse,urinary incontinence and obesity. It is antibacterial, vaginal antiseptic, Antipyretic, Anti-oxidant, Antidiabetes, Anti-asthmatic, Anti-migrane, Diuretic, Digestive and Vermifuge. Its healing properties are used in dermatological problems.

EXHIBIT 16 SACHA INCHI MATERIAL DATA SHEET

Name	**:**	Sacha Inchi
Scientific name	**:**	Plukenetia volubilis L
Common Name	**:**	Maní del Inca, Maní silvestre, “Inka Peanut”

Description
The Sacha Inchi, is a wild oleaginous plant that belongs to the Family Euforbiacea. It is an inconstant, climber and semi-woody plant that grows mainly on hillsides of the jungle.

Active principle
Omega group fatty acids (fat acids which are not produced by our organism but are important for our health.)

Oil Specifications

Palmitic acid	:	4.40 %
Estearic acid	:	3.20 %
Oleic Acid	:	9.60 %
Linoleic Acid	:	36.80 %
Linilenic Acid	:	45.10 %

Uses
Nutritional food. Its high content of fatty Acids of Omega group reduces Cholesterol and cardiovascular accidents.

EXHIBIT 17 SHARK CARTILAGE MATERIAL DATA SHEET

Name	:	Shark cartilage
Scientific name	:	Prionace glauca / Xiphias gladius
Common name	:	Shark Cartilage

Scientific name
Shark Cartilage is a tissue with no blood vessels. It has a component of proteins that prevents the formation of blood vessels. It is composed by mucopolysaccarides (glucosaminglicanes), which provides extra cellular support to some animal tissues.

Active Principle
Proteins, glucosamine, chondroitrin and minerals (calcium, zinc, phosphorus).

Technical specifications

Appearance	:	Producto en polvo fino
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
Shark Cartilage has regenerating properties of body tisues and is used to normalize bones joints, muscles, tendons and nerves that have abundant collagen. Fights-off Arthritis, Rheumatism, Neuritis, muscular, and bone pains. It prevents osteoporosis for its high content of Calcium, Zinc and Phosphurus. Shark Cartilage has been found verybeneficial for beneficial for the rejuvenatting and energy for the grown-ups, relieves fatigue, weakness and allergies. It is an excellent anti-inflammatory, reduces the incidence of muscular lacerations and the inflammation of articulations. It is used in cancer treatments that form solid tumors. In Psoriasis and chronic dermatological aliments.

EXHIBIT 18 PAICO LEAVES MATERIAL DATA SHEET

Name	**:**	Paico Leaves
Scientific Name	:	Chenopodium ambrosoides L
Common Name	**:**	Pozote, Te Mexicano, Yerba de Santa María

Description
Paico is a perennial herbaceous plant of about 30 to 50 cms., of height. It is characterized by its penetrating scent, compared to the eucalyptus and camphor. Its leaves are numerous and it has tiny flowers grouped in small clusters. It grows in tropical and sub tropical areas and adapts to any type of land.

Active Principle
Alkaloids, ascarid, tannins, terpenes, carvene, limonene, camphor, Methyl Salicylate, butiric acid, pectinas y mineral salts.

Technical specifications

Appearance	:	Product in fine powder
Color	:	Characteristic
Odor	:	Characteristic
Flavor	:	Characteristic
Heavy Metals		
Lead (as Pb)	:	Not more than 10 ppm
Arsenic (as As)	:	Not more than 3 ppm
Mercury	:	Not more than 1 ppm
Cadmium	:	Not more than 1 ppm

Microbiological Specifications

Mesophiles aerobics	:	Not more than 1,000 ufc / g
Fungus and Yeasts	:	Not more than 100 ufc / g
Detection of E. coli	:	Negative : 10 / g
Detection of Salmonella	:	Negative : 25 / g

Uses
Its well-known action as anti-spasmodic and carminative is used to relieve the digestive nuisances, colics of gases and to expel intestinal worms.
Antihelmintic, Digestive and anti-inflammatory. It relieves abdominal colics, nauseate discomfort and vomits. It controls dysentery and Hepatic ailments.

EXHIBIT 19 BARBASCO MATERIAL DATA SHEET

Name **:** Rotenone
Scientific name : Lochocarpus nicou L

DESCRIPTION

Rotenone is a natural Insecticide and Pesticide obtained by extracting solvents from the Roots of Barbasco or Cube (Lonchocarpus nicou L).
Rotenone is a selective contact Natural Insecticide. It is not systemic with properties to eliminate acaricides and parasites. It is considered as a Botanical Insecticide which is used in general as Pesticide.

Technical specifications

Appearance	:	Powder
Color	:	Characteristic
Odor	:	Characteristic
Active Principle	:	Rotenone at 98 %, 70 % and 40 % (+ / - 1).
Chemical Formula	:	C23 H22 O6
Molecular weight	:	394.43
Fusion point	:	163 ºC
Solubility	:	Soluble in organic solvents Little soluble in hot water.
Stability	:	Sun light and heat deteriorate Rotenone. It oxidates very fast in the presence of alkalis. Improves its action in an acid environment.
Ecological Effects:		Rotenone is Biodegradable. Does not destroys Ecosystem Is not Phytotoxic. Is not toxic for bees buy is very toxic for fish.

USES
Rotenona is used in the production of Biodegradable Organic Natural Insecticides. With Piretro they generate a synergy action improving its effectiveness in the moment of its application. They fight-off all type of flying and cringing insects.

Agriculture
Rotenona is used in fruit-bearing Trees (Citric, Banana trees, Mangos, Apples, Peach, Pears, etc.), Vegetables and legumes (Asparaguses, Tomatoes, Onion, Celery, Spinach, Cabbage, Turnip, Páprika, Radish, etc.), Potatoes, Bens and Ornamental Plants (Flowers)

Rotenona acts upon ingestion and by contact. It fights-off Thrips, mining fly, white Fly, Plant lice, Caterpillars, Grasshopper, red Spider, Moth, Scarab, etc.It is effective against quereza.

Cattle raising
Rotenone is used in the production of external anti-parasitic to exterminate fleas, lice, ticks, bedbugs and ectoparasites that attack bovine, equine livestock, sheeps, domestic animals and pets.

Aquiculture
Rotenon is used in the production of preparations to eradicate predators or undesirable fish in puddles, ponds or pools before they start an upbringing or cultivation of shrimps and / or prawns.

Others
Rotenone is used to control undesirable fish in reservoirs and artificial lakes (USA).

Storage
Keep Rotenone in tightly closed containers (black Polyethylene), in boxes and / or cardboard drums, in atmosphere that is protected from solar light and humidity. Keep it out from the reach of the Children, domestic Animals, Foods and Medicines.

Toxicity
Rotenone is moderately toxic. Non inflammable. Non explosive.Non Corrosive.

First Aids
When it contacts with the skin take off the contaminated clothes and wash immediately the affected area with abundant water and soap . If the skin gets reddish call the doctor.
If there is contact with the eyes, check if the victim has contact lenses and taken them off To wash with abundant water and simultaneously call the doctor. If the problem is for inhalation move the victim away from the expose area and make him/her breathe fresh air.
In the event of accidental ingestion and if the victim conscious and does not have convulsions give him/her one or two glasses of water to dilute the chemical substance and call the doctor immediately. If the victim is unconscious or has convulsions do not give him/her any liquid nor induce vomit. Look for immediate medical assistance.

EXHIBIT 20 ANTHOCYANIN FROM PURPLE CORN MATERIAL DATA SHEET

Name : Anthocyanin from Purple Corn

Description: Anthocyanin, is obtained by aqueous extraction from Purple corn (Zea mays raza Kcully)

Active Principle Cyanidin

TECHNICAL SPECIFICATIONS

Appearance	:	Dark purple powder with a faint characteristic odor. Dark red liquid with a faint characteristic odor.
Concentration	:	Dark purple powder : 100 - 500 Color value Dark red liquid : 30 - 100 Color value
Solubility	:	Soluble in warm acids water (50° C). Insoluble in oils.
pH Sensitivity	:	The color changes with pH pH : 2.5 – 3.8 : Red pH : 6 and upwars : Blue
Stability	:	Anthocyanin, has good stability for heat and light.
Arsenic (as As)	:	Not more than 3 ppm
Lead (as Pb)	:	Not more than 10 ppm
Heavy metals (Cd, Cr, Zn, Hg, Sn)	:	Not more than 40 ppm

Uses
Anthocyanin, is a product specially developed to be used in the coloring of :
Fruit juices, Dehydrated foods, Fruit jams, Fruit preserves, Fruit canning, Beverages, Chewing gums, Candies, Sugar confectionary, Sherbets, Frozen products and Dry mixes.

Storage
Store in tightly sealed containers in cool dry conditions away from direct sunlight.

Status european communities
Anthocyanin, from Purple Corn meets the EC Code E-163

Foodstuffs to which only Anthocyanins E-163 may be added

Foodstuffs	Maximum Level
Red Marble Cheese	Quantum satis
Aromatised wine- based drinks (Except Bitter soda) and Aromatised wines as mentioned in Regulation (EEC) No 1601 / 91	Quantum satis
Vegetables in Vinegar, Brine or Oil (Excluding olives)	Quantum satis
Fruit – Flavoured Breakfast Cereals	200 mg / Kg (Individually or in combination)
Jam, Jellies and Marmalades as mentioned in Directive 79 / 693 / EEC and other similar fruit. Preparations including low calorie products	Quantum satis

Uses of the anthocyanins from purple corn

- Anthocyanines give color to drinks, sweet and candies, bakery products, vegetables, canned fish fats and oils, marmalades and jellies, crystallized fruits and syrups, fruit xaropes, soups and flavorings.

- Anthocyanines from Purple Corn is used ito prepare sodas (Chicha morada), sweets (Mazamorra morada), colorant for fruit juices (Strawberry) and also in Vermouth, Wines and Vinegars. In Japan they are used to color Candies, Ice creams and drinks

- The pharmaceutical use of Anthocyanines is recognized in Ophthalmology for its properties of to increase the visual acuteness and to improve night vision; in the treatment of diverse dysfunctions of blood circulation (Cholesterol) and recently thanks to the Professor Tomuyuki Shirai research from th School of Medicine in Nagoya City University and the Company San Ei Gene in Japan, it was conclude that the active principle of Purple corn prevents the presence cancer in the thick intestine (Cancer to Colon)

- Likewise according to our Natural Pharmacopeia, Anthocyanines from Purple corn acts as regulator of high pressure.

Comparative advantages of anthocyanines from purple corn

- Natural product recognized by the European Union with the Code e-163 and also with the same Code for the Japanese Legislation.

- Anthocyanines from Purple corn is more stable than the enocyanine from grape under light, heat and mainly to pH changes.

- Anthocyanines from Purple corn at a pH between 3 and 3.5 remains with a yellowish Red color, while the enocyanine turns bluish under the same conditions.

- Anthocyanines from Purple corn do not contain sulphurs whereas the enocyanine from grapes does.

- Anthocyanines from Purple corn access the Kosher Certification.

- Anthocyanines from Purple corn regulates high pressure and fights-off Cancer to the Colon.

- In Peru, Purple corn has been used for centuries, without any toxicity problem.

Medicinal purple corn (revista agro negocios october / november 2001)

Thanks to research on purple corn carried out by Professor Tomoyuki Shirai from the School of Medicine at Nagoya City University and the Company San Ei Gene, it was concluded that the vegetable pigment of this corn (family of the anthocyannines), prevents cancer to the large intestine.

Doctor Noboyuki Ito in a recent visit to Peru explained the procedure carried out in the Japanese laboratories. In some laboratory tests with rats, they were first administered a cancerigenic substance chemically synthesized so that they can easily have the desease . Then they were given natural cancerigenic substance blended in their food that is found in the burned parts of meat and roasted fish, together with 5% of the vegetable pigment, during 32 weeks. As a result, it was discovered that 20 rats which were only given the cancerigenic substance, 17 (85%) developed cancer of the large intestine, in comparison to eight rats (40%) that took the anthocyannine.

According to the International Agency for research on Cancer (IARC), the capacity of the cancerigenic substances contained in burnt areas of foods is enough to propitiate cancer in people.

According to the Dr. Ito, to prevent the risk of contracting this desease it is recommended to add in the daily food the consumption of products with high content of fibers and low animal protein, fat and hydrates of carbon; it is also recommended foods with Calcium, Vitamin D and vegetables as Cabbage, Cabbage of Brussels and Broccoli.

The Company San Ei Gene, in less than a year, has established a branch in Peru. they are still undertaking research studies to use the colorant as raw material for foods used for medicinal applications due to the alarming increase intestinal cancer that has been observed in developed countries as Japan.

Anthocyannine was the reason of these studies. It is mainly concentrated on the corncob of purple corn and is exported from Peru countries like Japan and Germany that use it to balance the color of fantasy liquors. Locally, anthocyanine is used to color yogurt and in smaller quantities for alcoholic drinks, especially wines.

EXHIBIT 21 NATURAL INGREDIENTS SECTOR ASSESSMENT MATRIX – Biotrade Facilitation Program BTFP

MARKETING CRITERIA	SCALE	SCORE	EXPLANATION	QUALIFIERS
Scope and quality of existing market information.	Inadequate/ uncertain	1	Information on current mrkt allows only an approximate demand estimate.	Some product exports are being consolidated, according to the natural ingredient sector, as shown in statistics. There is market data on consumer trends. Responsible: National Commission for Export Promotions – PROMPEX, Foreign Trade Association of Peru – COMEX, Exporters Association – ADEX, Customs
Current and projected market demand.	High	2	It is known that mrkt demand on this product is high.	There is an annual demand increase on this product; however there are tariff barriers that could limit the export offer of natural ingredients. Responsible: National Commission for Export Promotions – PROMPEX, Ministry of Foreign Affairs.
Production scale	Moderated	1	Reasonably organized production and likely commercially attractive.	There is enough production capability, including idle installed capacity. According to the natural ingredients exports: Yacon Extract/Leaves, Sangre de Grado Extract, Maca Extract and Tara Gum have a growing rhythm; Cats Claw Extract and Anthocyanin from Purple Corn have slightly declined; and Camu Camu is still fluctuating. The strategy is to capture new customers, introducing the concept of sustainable handling raw material. Responsible: National Commission for Export Promotions – PROMPEX, Economy Department, Agriculture Department, : Natural Resources National Institute – INRENA, Netherlands Import Promotion Center NIPC, CCI.
Product availability for the mrkt	Already in the mrkt	2	Product already sold in the market.	Peruvian natural ingredients are available in the market, except for (Muna and Sacha Inchi) that are still under development. Supported by Biotrade initiative, Netherlands Import Promotion Center NIPC and CCI this important sector will be relaunched. Responsible: National Commission for Export Promotions – PROMPEX, Biotrade, National Products Peruvian Institute – IPPN, Agro-Industrial Development Institute - INDDA
Competition (to keep mrkt niche)	Moderated	1	There are several alternatives for this product.	There is a strong competition basically of Asian products (ginseng). Besides the USA importing our raw material (Cats Claw , Maca) is capable to offer a better product because of its high level technology.

			Could be easily replaced.	Responsible: National Commission for Export Promotions – PROMPEX, Ministry of Foreign Affairs, CCI, Netherlands Import Promotion Center NIPC.
Assessment of Financial feasibility	Completed, moderated return.	1	A trustful financial feasibility assessment has been considered and a moderated return is foreseen.	Most of the interviewed companies are financially weak. This means they need to contact international financial companies to develop their exports and create new projects. The national exports funding is expensive and the procedures are annoying. The natural ingredients under study have an attractive return; therefore many companies are very interested in joining this sector. Responsible: Netherlands Import Promotion Center NIPC, CCI, National Commission for Export Promotions – PROMPEX, Banks.
Product standard	Moderated	1	Product quality standards have been developed by the community that need to be improved.	The quality standards of natural ingredients are high, but there are no national technical norms to support them. The National Products Peruvian Institute – IPPN is making an interesting job. b. *Responsible: National Commission for Export Promotions – PROMPEX, Biotrade, National Products Peruvian Institute – IPPN, National Institute for the Defense of Competition and Protection of Copyright - INDECOPI, : Netherlands Import Promotion Center NIPC, DIGESA*
Trade potential in Fairs.	Moderated	1	This product is appropriate for trade production in fairs; but there is an uncertain market interest.	Natural ingredients produced in this country are appropriate to participate in specialized events (FIE, Health Ingredients Europe, Vitafoods International Ltd) Responsible: National Commission for Export Promotions – PROMPEX, Netherlands Import Promotion Center NIPC.
Organic Certification / Eco-certification Potential	High	2	This product could be organically produced or eco-certified. It has market.	All the products can be organically certified. The problem lies on the certification costs that are not usually affordable for the companies. Responsible: BioLatina, SGS, Bureau Veritas, SKAL, Biotrade/ National Commission for Export Promotions – PROMPEX.
SUBTOTAL		12		

ECOLOGICAL CRITERIA	SCALE	SCORE	EXPLANATION	QUALIFIERS
NATURAL SPECIES CONSERVATION STATUS	Sufficient	1	Species are found in enough quantities to satisfy demand, but it can represent a long term risk.	We have to raise the awareness of biodiversity products exporter companies that they should manage their products with sustainable development criteria. Responsible: Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE, Biotechnology Institute of the Agrarian National University of La Molina - IBT NGO's (Pro Nature)
Regenerative/ domestication Potential	High	2	Source species of this product are easily regenerated; or could be domestically produced.	Similar to the above-mentioned Responsible: Agriculture Ministry, Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE.
Harvest Impact in the species survival	Neutral	1	Harvest of the source species of this product does not impact this species nor any other.	The staff involved in the development of these activities must avoid negative impacts or avoid modifying ecosystems. Responsible: Agriculture Ministry, Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE.
There is an administrative system of natural resources	Existing but improvements are required	1	Harvest of the source species of this product is part of a natural resource administration system that needs to be improved.	Managerial system of INRENA must be improved in regions and Departments to avoid being only a Reception Counter. These agencies decentralization has not been efficient because INRENA (Lima) is the only one granting licenses Responsible: Environment National Council –CONAM, Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE.
Availability of an adequate environment certification	Non existent	0	There is not an appropriate environmental certification system	It is necessary to have international standards for the environmental certification. It would be advisable to join efforts for BIOTRADE Initiative, Amazonia Pouch and CONAM to obtain an international environmental certification.

mechanism			for the product.	Responsible: Environment National Council –CONAM, National Commission for Export Promotions - PROMPEX, BIOTRADE, Natural Resources National Institute – INRENA.
Potential for organic production	Existing but it is not useful	1	Source species of this product can be produced organically, but currently they are not.	There is organic production; but there is a lack of financial resources to certify the production as organic. Responsible: Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE
Potential for mono crops production	Existing but it is not useful	1	Source species of this product could be produced as monocrops, but currently they are not.	The use of Raw material in our natural ingredients from biodiversity handled with sustainability criteria should be fostered. This requires a great effort to train suitable staff. Responsible: : Natural Resources National Institute - INRENA, National Commission for Export Promotions - PROMPEX, BIOTRADE, NGO0s (Pro Nature)
SUBTOTAL		7		

TECHNOLOGICAL CRITERIA	**SCALE**	**SCORE**	**EXPLANATION**	**QUALIFIERS**
Technology processing requirements	Moderate	1	Required technology to process this raw material is complex and hard to find locally.	The required technology to process natural ingredient extracts is complex and an additional technical support could be needed. This is different for intermediate products as dehydrated and micropulverized products, where technology is simple and available locally. Responsible: Netherlands Import Promotion Center NIPC, Agro-Industrial Development Institute - INDDA, Universities (Agraria, Ingenería, Catolica, Cayetano Heria and San Marcos)
Quality control requirements	Moderate	1	Quality standards for these raw materials could be assisted by BC producers, but careful monitoring will be needed.	A careful monitoring is required to purchase raw material or to sell natural ingredients (extracts). The access to quality standards will be difficult to reach in native communities. The answer could be the Regional Universities that have equipments to undertake analysis. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX, Universities, : Netherlands Import Promotion Center NIPC, CCI.

Infrastructure condition	Moderate	1	Additional local infrastructure will be needed for these raw materials production requirements and / or the processing of raw materials.	Regarding raw material, it is necessary to have primary treatment plants (work in stages) which the communities could reach a greater family and social integration. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Human Resources / skills (expertise)	Moderate	1	Some community skills are needed for successful production of these raw materials.	A criteria of cleaning and tidiness in production should be provided to the communities since their inhabitants have intrinsic knowledge that could be improved with team work. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Human resources / number	Moderate	1	There is a moderate supply of human resources in the community for a successful production of raw materials.	Knowledge, through good training, should be transmitted to all the community to generate generational transference for a continuous improvement of primary productive processes. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX, External Funds.
Technical support skills	Available	2	The technical skills required to support the BC production of the MP are available locally.	Technical skills of the community members is innate, but their organization must be improved to make it more efficient and thus improve the quality life of the community. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
SUBTOTAL		7		

SOCIO-ECONOMIC CRITERIA	SCALE	SCORE	EXPLANATION	QUALIFIERS
Raw materials production adaptation by local producers (based in the community – BT)	Low	0	Required raw materials for this product are convenient for the private sector production	By their own initiative, private companies are not going to improve biodiversity raw materials prices. It is necessary a work to raise awareness of the managerial sector to improve raw materials prices that come from biodiversity with sustainable development criteria. Responsible: National Commission for Export Promotions – PROMPEX, Biotrae, Biotrade Facilitation Program BTFP.
Experience with Products	Moderated	1	BT producers have some previously experience producing and selling these raw materials	There are native communities and family groups that sell their products to a local middleman, they then sell the products to factories, Laboratories and/or Exporters. There are few private companies that deal directly with native communities and family groups. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Opportunities to add value by producers BT	Moderated	1	There are some opportunities for BT producers to add value locally, though could be of difficult access.	There are opportunities to add value to the raw materials provided the process is followed: cleaning, selection, classification and calibration of the raw material in agro production areas. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Generating employment potential	High	2	There are many opportunities to create significant additional employment as a result of this	It is possible to generate new work positions if in the beginning of the productive chain the previously mentioned process is followed and generate an added value. These products will have a largest demand, favoring the creation of new work positions. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Additional indirect benefits to communities	Low	0	There are no benefits for the communities from raw materials production.	Nowadays there are no indirect benefits for native communities but generating more work positions the communities will obtain larger resources and this will raise quality life of the population. To obtain indirect benefits the staff in charge of raw materials primary treatment must be

as a result of the production				trained. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.
Genre impact	Man & Woman		The benefits of the production of these raw materials are accrued equally for men and women.	Production activity impact of these raw materials is not only for men and women in general, but many times depends on the type of product to determine the incidence degree: for instance: Cochineal and Camu Camu collection counts with the help of children. Responsible: Biotrade, National Commission for Export Promotions – PROMPEX.

EXHIBIT 22 PRIVATE ENTERPRISE ROSTER

Argos Export SA
Agro Industrial Chanchamayo SRL
BioMaxim
Bureau Veritas QI (Quality International)
CHR. Hansen S.A.
Corporación Infarmasa / Rain Labs
Deshidratados Tropicales SAC
Ecopro SA
Globenatural Internacional SA
Hersil S.A.
Imanpro SRL (Ingeniería de Mantenimiento y Proyectos)
Industrial Vetsi Internacional SA / INVETISA
Laboratorios Fitofarma EIRL
Laboratorios Regis SA
Laboratorios Lilly
Liofilizadora del Pacifico SRL
Maquidal S.A.C.
Peruvian Nature S & S S.A.C.
Perú Amazon Export SA
Peruvian Heritage S.A.C.
R. Muelle S.A.
SGS del Perú SAC
Unimed del Perú SA

EXHIBIT 23 Product / Enterprise Matrix

PRODUCT	EXPORTER ENTERPRISE, 2002
1) Cat's Claw Extract	Natura Peruana SRL, Agroindustrias Floris S.A.C., Inversiones Gardina E.I.R.L., Liofilizadora del Pacifico SRL, Universal Trading S.A., Fundación para el Desarrollo Agrario.
2) Maca Extract	Carbones y Derivados S.A.E.M.A., Panpacific Corporation S.A., Empresa Agroindustrial del Perú S.A., Pebani Inversiones S.A., Gestiones y Representaciones Internacionales S.A., Koken del Perú SRL.
3) Camu Camu Extract	Koken del Perú SRL, Agrícola San Juan S.A.C., Novandina SRL, Empresa Agroindustrial del Perú S.A., Amazon Herb S.A., Nutrinka S.A.C., Gestiones y Representaciones S.A., Agroindustrial Chanchamayo SRL, Cabex S.A.
4) Tara Gum	Exportadora el Sol S.A., Transformadora Agrícola S.A.C, Productos del País S.A., Exandal S.A., Exportaciones de la Selva S.A., Argos Export S.A., Inka Gums S.A.
5) Rotenone Extract	Ecopro S.A., Industrias Eco Agro Export SRL
6) Sangre de Grado Extract	Amazon Herbs S.A., Peruvian Nature S&S S.A.C. Novandina SRL, Cabex S.A., Expo. Amazonicas Nativas SRL.
7) Yacon Extract	Agroindustrias Floris S.A.C., Natura Max S.A.C.
8) Anthocyanin from Purple Corn	Globenatural Internacional S.A.

Source:Customs / Prompex 2003

EXHIBIT 24 Statistics of natural ingredients exports by product and by exporter enterprise, 2002

PRODUCT	EXPORTER	AMOUNT (Kgs)	FOB VALUE (US $)
Carmine,Carminic Acid	Montana S.A.	48,130	2'867,870
Solutions / E-120	Colorantes & Extractos S.A.	41,715	2'140,900
	Biocón del Perú S.A.C.	22,975	1'453,148
	Productos Naturales de Exportación S.A.	20,908	1'317,304
	Globenatural Internacional S.A.	17,381	1'095,018
	Orginor Chemical S.A.C.	16,810	893,119
	Otros	6,962	399,703
			US $ 10'167,062
Bixine, Norbixine	Aicacolor S.A.C.	39,142	1'484,568
Solutions / E-160b	Biocon del Perú S.A.C.	75,629	847,544
	Productos Naturales de Exportación S.A.	16,235	490,585
	Globenatural Internacional S.A.	9,975	202,450
	Colorantes & Extractos S.A.	2,932	72,899
	Agrocondor SRL	1,000	29,700
	Montana S.A.	356	7,756
	Otros	370	943
			US $ 3'136,445
Xanthophyll of Marigold	Agrícola Barranca S.A.	2'528,975	8'376,259
E-161b	Agrotrujillo S.A.C.	99,380	120,480
	Rocsa Internacional S.A.	33,400	107,846
	Piveg del Perú S.A.	10,000	40,800
			US $ 8'645,385
Anthocyanin from Purple Corn E-163	Globenatural Internacional S.A.	1,400	**US $ 98,000**
Curcumine / E-100	Biocon del Perú S.A.C.	918	**US $ 11,021**
Cat's claw and byproducts	Laboratorios Induquimica S.A.	5,466	199,996
	Exportaciones Amazónicas Nativas SRL	73,980	169,002
	Overseas Business Corporation S.A.	200	163,047
	Hersil S.A. Laboratorios Industriales	1,597	118,917
	Deshidratados Tropicales S.A.C.	1,600	114,980
	Peruvian Investment S.A.C	200	98,827
	Otros	85,640	425,667
			US $ 1'290,436
Maca and byproducts	Panpacific Corporation S.A.	9,584	667,489
	Koken del Perú SRL	33,823	302,075
	Novandina SRL	39,340	233,400
	Laboratorios Induquimica S.A.	5,110	170,682
	Deshidratados Tropicales S.A.C.	12,005	133,870
	Hersil S.A. Laboratorios Industriales	4,121	121,781

	Otros	*189,566*	*1'386,943*
			US $ 3'016,240
Yacon and byproducts	*Alfil Andina S.A.C.*	*8,454*	*72,650*
	Deshidratados Tropicales S.A.C.	*3,500*	*17,850*
	Empresa Agroindustrial del Perú	*2,590*	*14,804*
	Cabex S.A.	*984*	*3,440*
	Quimper International E.I.R.L	*100*	*2,650*
	Otros	*3,106*	*41,650*
			US $ 153,044
Sangre de Grado and Byproducts	*Laboratorios Induquimica S.A.*	*1,441*	*48,378*
	Peruvian Nature S&S S.A.C.	*2,321*	*38,292*
	Agroforestal Pebani S.A.	*2,481*	*24,091*
	Amazon Herb S.A.	*2,443*	*18,000*
	Laboratorios M & G Vida Natural EIRL	*95*	*2,673*
	Laboratorios Fitofarma EIRL	*106*	*2,233*
	Otros	*4,462*	*45,356*
			US $ 179,023
Camu Camu and byproducts	*Agrícola San Juan S.A.C. (Backus)*	*29,245*	*522,328*
	Koken del Perú SRL	*1,200*	*45,540*
	San Ei Gen FFI Latín América Perú SA	*717*	*19,361*
	Novandina SRL	*100*	*5,248*
	Nutrinka S.A.C.	*170*	*4,849*
	Empresa Agroindustrial del Perú SA	*200*	*4,400*
	Otros	*843*	*9,118*
	US $ 610,844		
Tara Gum / E-417	*Exportadora el Sol S.A.*	*232,050*	*668,220*
	Transformadora Agrícola S.A.C.	*61,750*	*233,275*
	Productos del País S.A.	*70,100*	*197,453*
	Exandal S.A.	*37,300*	*167,850*
	Exportaciones de la Selva S.A.	*24,700*	*106,150*
	Otros	*41,025*	*136,838*
			US $ 1'509,786
Rotenone Extract	*Ecopro S.A.*	*6,700*	*63,753*
	Industrias Eco Agro Export	*1,115*	*13,500*
			US $ 77,253
Saponificated of Paprika	*Agrícola Barranca S.A.*	*611,002*	*2'162,447*
			US $ 2'162,447

Source : Customs / Prompex / GPMSA 2003