

**Escuela de Agronomía,
Universidad de Las Américas.
Ayurvastu®,
La Escuela Indoamericana
de Ayurveda y Vastu.**



Work Document:

Towards a
Research and Development Program on
Phytomedicines for Traditional Medicine Ayurveda

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1. Introduction

Ayurvastu®, the [Indo-American School of Ayurveda and Vastu](#) has as a mission to develop and to maintain services that allow a professional and permanent training, based on specialists by sections, dedicated to the research and development of the good practices of the Traditional Medicine (TM) and the Complementary Alternative Medicine (CAM) with origin bases in general, and Ayurveda and Vastu with Vedic bases in particular, using the Ayurvastu® Health Centers Net as well as the available Fields for professional and technical Training, administered by the Public Health System available for this matter

A CFPT is the hygienic space in which the students of the Health division become competent in a profession, confirming his theoretical knowledge with its practical exercise, achieving in this way the graduated profile defined in the program of formation. See [NormaCFPT FINAL 260707](#).

Such services have wide and demanding characteristics, from which it is needed to open the maximum capacities of professional collaboration, in order to make possible the formulation of plans and programs of research and development, not only to form ayurvedic specialist that the national health system needs, but also to create a support system, which facilitates the professional performance and update of the same, in benefit of the population.

The School of Agronomy of the [Universidad de Las Américas](#) concentrates its occupation in the formation of the human capital for activities linked to the managing, use and protection of the natural renewable resources and its transformation, creating for this fact, professional agronomy engineers, environmental engineers and bio-engineers. Technological research is an important complement in the formative process, which allows future professional to link earlier with his market of placement, legitimizing the occupation of the School.

The connection task of the School, it is defined by the joint work with the pertinent sectors, to which it is provided with competent professionals, for their knowledge, skills, values and attitudes, everything which allows to develop productive systems for the production of healthy and compatible food and prime matters with the protection of the environment. Likewise, the School tries to orientate the professional formation to entrepreneurship and innovation, to generate professionals capable in designing and developing products, processes and services intended to the well-being of the society.

Definitions for a Cooperation Agreement

A previous and very important condition to consider before initiating any activity under the look of Ayurveda is to know the Vedic philosophy behind the Wisdom that, with an integral approach, includes different knowledge such as health, kinesiology, psychology, nutrition and natural aspects of the education up to the development of art, as way of aesthetic expression of happiness.

An integral approach will allow us defining the ways and resources to solve the challenges of this approximation. The Universidad de Las Americas and Ayurvastu, "The Indo-American School of Ayurveda and Vastu" have initiated conversations to materialize a cooperation agreement, which allows to formulate joint programs, which they could define and execute specific projects, like phytomedicines and as much as complementary areas as possible, with the students' active participation and their

teacher's help as guidance, whose results of Thesis will constitute the base of the entrepreneurships or research lines.

As a result of this idea, on Wednesday September 12th 2007, the School of Agronomy of "Universidad de Las Americas" (UDLA) in conjunction with Ayurvastu, "The Indo-American School of Ayurveda and Vastu", organized the Seminar "Towards a Research and Development Program on Phytomedicines for Traditional Ayurvedic Medicine", with the goal of obtaining updated information on Traditional Medicine Ayurveda with its possibilities of introduction in the Chilean health system, throughout interchange of points of view and work documents, which allows to define needed conditions for Ayurveda Consultants' formation, starting from health professionals, and for the formulation and production of phytomedicines and its therapeutic use.

The present document was extracted from the Seminar, which includes the main orientations for a Research and Development Program (R&D) on Phytomedicines for Traditional Medicine Ayurveda.

2. Role of the School of Agronomy and Bioengineering of the UDLA

Bioengineering is known as a contact area between companies and organizations for the conjoined identification of needs and opportunities for the formulation of R&D Programs and Projects on biological systems, in the fields of molecular biology, microbiology and engineering process. This orientates the technological applications destined to the agro-industry or for the human and animal health, generating and/or transforming products of the food industry, pharmacy, cosmetics, environmental services or intermediate inputs.

The group of bio-technologies of interest for the Program includes utilizing organisms of the vegetable kingdom or its parts, to obtain or modify products, to improve genetically plant or animals, or to develop microorganisms for certain purposes such as the use of bacteria, yeasts, algae and plants to provide them with new capacities, or for its use as biological reactors (bio-reactors), decontaminating or producing active substances of high added value.

As a particular interest for the Program there are the phyto-chemical processes of cellular extraction procedure of natural molecules contained in plant structures. Such as aromatic plants, essential oils and fragrances used in food, cosmetics and perfumery, plants that produce sweeteners, scavengers, preserving and stabilizers used as additives in the food industry, or for antioxidant, amino acids, vitamins, enzymes and dietetic fibers obtained of residual material from agro-industry processes, or obtained from forest biomass applied in nutraceuticals, or the case of algae and micro algae that contribute with cyto-toxines as active bio-substances in the manufacture of drugs.

Medicinal plants are inside this universe, producing compounds with therapeutic effects, as phyto-drugs or phytomedicines, like molecules with anti-inflammatory effects, immune antidepressants, antibacterial, antibiotic, analgesic, etc. Functions that can be found also in vegetables that are composing the food diet of the family, in agreement to the geographical zone of residence.

3. Objectives of a R&D Program on Phytomedicines

Dealing with thousand-year-old phytomedicines, the R&D Program will be focused on the identification and characterization of available vegetable material and the latest research on the best adjustments and agronomic managing of the plants that contain the active principles of interest, for then develop products prescribed by Ayurveda professionals. In this way, the use and consumption of phytomedicines will be facilitated by a part of the modern society in a global scale.

These objectives involve the formation of multidisciplinary work teams, with participation of scientists of the productive sector, in the execution of the scientific, technical and economic necessary studies, in order to develop the methods and crop growing managing, harvest and post-harvest, designing methods of processing, development of formulations, compositions, product presentation, package, packing and distribution, information on his dosage and forms of administration.

For the project implementation, the School of Agronomy of the UDLA provide, at the Program disposal, the infrastructure of laboratories and the [Los Nogales](#) Experimental Station, with organic certification (1).

4. Traditional Medicine Ayurveda

Ayurveda was born more than 5000 years ago in India, as the first life science of holistic longevity and health that the human beings know as legacy of the Indian Vedic wisdom, which essence describes and teaches how the human being can and should find his perfect health reaching the self-realization in this planet. The Ayurveda treats the man in his physiological dimension in each one of the related systems: psychological, social, ecological and spiritual.

The most practical application in the current world is the possibility of education before treating and understanding that the absence of disease is not a symptom of good health. Because of it, the Ayurveda medicine and the Vastu architecture have a significant contribution in the promotion of health and prevention of pathologies.

Ayurveda is divided in 8 parts of study or Asthangayurveda, for the study of symptoms and formulation of diagnoses, which allows determining the necessary therapies (2).

1. Kauramrtaya, pediatrics, gynecology, obstetrics and embryology
2. Rasayanatantra, or the science of the geriatrics and longevity.
3. Chikitsa, or internal medicine.
4. Bhutavidya, or the science of the subtle states of the being or psychiatry
5. Veejakaranatantra, or the science of the elixirs, compounds or aphrodisiac.
6. Salia, or surgery.
7. Shalakya or otolaryngology,
8. Agadatantra, or toxicology.

One of the most important aspects of the Ayurveda is the definition of balance condition of the physiology in term of 3 big subtle metabolic principles that govern and direct the Mind-Body Axis, which are: Vata, Pitta and Kapha. Such principles allow to know the constitutional type of every individual in agreement to the combination that exists among them, defining a personalized nourishment program, the use of

ayurvedic phytoterapics supplements, daily and seasonal routines, to promote the integration to balance biological rhythms and also to define the most appropriate routine of exercises.

The concept of nutrition and digestion is a great chapter to consider in the Ayurvedic medicine, since not only it teaches how to choose the food in agreement to our typology, but to understand that if we do not have a metabolism adapted to the digestion of this food, we will be the generators of our own diseases. The food not only nourishes to our cells, but they accede to the subtle levels of our physiology, that is to say, to the authorities that direct and govern all our organism, realizing a therapeutic action; for example, in a cancer patient, we will have to reduce all that food that stretch to proliferate the neoplasm cells.

These subtle properties of foods affect the mind, for example, the piquant and acid food produce an aggressive mind, old food produce a negative and sluggish mind and the easy digestion food with sweet flavors (rice, milk), fruits and vegetables will produce a calmed condition and positive mind (3).

Among the multiple Ayurveda treatments and therapies are: Yoga, Purvakarma (soft detoxification), Panchakarmas (intense detoxification), Navratnatantra (therapeutic use of gems or stones), Ekadhasy (fasting), Jyothisa (therapeutic use of the astrology and the cycles of the universe), etc. Being the Samana or the treatments with plants and its derivatives such as roots rhizomes, stems, leaves, seeds, extracts, oils, flowers and fruits, the most related to phytomedicines (2).

This situation requires identify those selected Ayurveda plants that can be organically cultivated in the country, in ideal conditions to achieve the maximum curative efficiencies, in combination with defined ayurvedic therapies. This condition could imply the development of greenhouses, in organic certified areas for agriculture, as also the search of native species that could show similar therapeutic effects to ayurvedic plants, with the assured acclimatization by his native character.

Although the list of plants used by Ayurveda is greater that 60.000, constituting the base of the knowledge of the naturism and herbals studies extended over the world, the efficiency of a Samana, in a treatment Ayurveda, will be possible only if the specific intention and the communication between the internal universe (the own body) and external universe (the environment), exists with the correspondent action of phyto-medicine, that complicates the use of a treatment that makes necessary the good education of Vedic knowledge in a professional

With this frame of reference, the mission proposed for a R&D Program on Ayurvedic Phytomedicines, it is to support an updated database of roots, rhizomes, stems, leaves, seeds, flowers, fruits, extracts and oils of plants and its combinations that considers: the presence of subtle elements or energy in the plant, the local conditions of cultivation and the processes of production, in order that the Vidya is able to prepare the psychic area for the therapy "mind - body system". The previous suggests a narrow relation of this Program with the demand of a Program of Ayurveda Doctors' formation of the Ayurvastu School, in alliance with Chilean Universities, with the support of those from India, in complementary roles (4).

5. Toward to Phytomedicine Formulation

The experience obtained from research works fulfilled by the Natural Products Laboratory of the Pharmaceutical and Toxicológica Chemistry Dept., Faculty of Chemical and Pharmacist Sciences, University of Chile, has allowed distinguishing different aspects that are necessary to know before the formulation of a phyto-medicine (5):

1. Having a standardized mother mixture, from which it is possible to formulate the phyto-medicine. This mixture must be elaborated from a homogeneous vegetable sample and botanically qualified, as well as some active principle that certifies us the process of cultivation and ideal time of crop of the vegetable material.
2. Realizing studies of toxicity y/o therapeutic range of the prepared one, who credit that its administration will not provoke adverse effects in the individuals.
3. Executing Pharmaceutical studies in animal models that allow evaluating therapeutic doses. It is necessary to indicate that these tests must consider the therapeutic use that native medicine has given to the medicinal plants.
4. With these precedents it is possible to formulate phytomedicines and try its use in human beings.

6. Critical points of the Phytomedicines Marketing

The Medicinal Plants are used from remote times as the most important resource to solve health problems of peoples. Today, so much in the developed countries like in the in-development and underdeveloped countries, the medicinal plants are used as domestic remedies, herbal teas, nutraceutic foods, raw material for the pharmaceutical industry in elaboration of products such as free sale products and others, representing an important percentage of the global market of drugs.

For pharmaceutical industry medicinal plants represent (6):

- Source of new and pharmacy-chemical activate molecules, (synthesis does not work without models).
- It allows obtaining pharmaceutical products with minor side effects.
- It allows satisfying new consumer habits, who prefer natural products in detriment of synthetic products, in all the segments of the market: health, nourishment, cosmetics, wardrobe and hygiene sector.

Industry general requirements are: prime matters with satisfactory quality, quantity, regularity and cost. When it is advanced in the added value chain, difficulties or critical points in the productive chain are major; buyer specifications are every time major and more rigorous: % of dampness, identification and tenor of p.a., total solids, stability, biological activity, dose, etc., which deserves a narrow relation Buyer-Producer/Manufacturer.

The increasingly informed final consumer wants original products – only those ones of quality, of last technology, absence of toxicity, effective and to reasonable prices.

Depending on the level of productivity, the previous factors force to the Industry to devote to:

- Adopt and promote Good Agricultural Practices, GAP
- Establish and apply Good Manufacturing Practices, GMP
- Quality control and standardization (identity, nomenclature, origin, ingredients, taxonomy)
- Development of analytical methods, pharmacological essays and biological analyses.
- Establishment and conformity of Good Commercial Practices, GCP
- Efficacy and safety evaluation
- Risk/benefit analysis of the commercial-favorable and reproducible product across the vital cycle.

The great utilization of the medicinal plants, advances of the technology and the modern analytical technologies have transformed its study, development and production, as a real challenge for the Agro-industry, for Research Centers (Universities, Private Centers), Distributions Centers (Drugstores) and for the pharmaceutical industry, in order to obtain effective save, uniformed and quality products.

The exposed precedents indicate that R&D Program on Ayurvedic Phyto-medicines must begin strengthening the market of native or autochthonous medicinal plants, to present:

- Great potential, so for internal consumption as for exportation.
- Big expectations on research and development – INNOVATION
- Obtaining almost exclusively for natural Recollection
- Low price for quality, quantity and regularity lack in the offer.
- Lack of monographs: with correct description of the species, used part of plant, p.a. identification, pharmacological activity, safety, recommended dose, etc. See [WHO Model](#).

Aspects that indicate a difficult but promising market are:

- Official information is generally very inexact
- Information does not reflect the reality
- Market is slightly regulated
- Marketing chain includes pharmaceutical industry, drugstores, supermarkets and naturist centers
- Extracts for cosmetic and food industry are in recent marketing
- Availability of land, work and climatic are in exceptional conditions
- There is a constant growth of phytoterapics world market (> 12 % in the last 12 years, A. Cáceres 2006, Buenos Aires)
- There is institutional interest to lean and develop innovative products (FIA, CORFO)
- It is possible to strengthen the national identity, generating patents.

7. Actions for next steps

1. It is clear that to initiate a R&D Program on Ayurvedic Phytomedicines is an opportunity that must be implemented with a narrow relation company – university, facilitated for governmental policy that stimulate the productive insertion of phytomedicines in the national pharmaceutical industry, similarly to Brazil (7)

2. Nevertheless, beyond the agreement that a few companies and universities can realize to initiate the Program with specific projects, the Ayurveda is a system of knowledge that cannot be partially treated, so that it is precise to establish a [Net Ayurveda of Cooperation in Medicinal Plants](#), which integrates collaboration of allopath physician, vidyas (ayurvedic physician), therapists, biologists, biochemists, chemist-pharmacist, biotechnologists, agronomic engineers, commercial engineers, attorneys, psychologists, educators and philosophers, among others.

3. This Net certainly will be able to integrate mass media, schools, laboratories, companies and specializing magazines, with the production of seminars and events, from which Monographs will be derived, facilitating standardization of the medicinal plants and vegetable drugs, formation of health professionals, Industry-Suppliers relation, legislation, regulation and sanitary homologation and promotion to needed level, of new products as supplements, functional food, phytomedicines, herb teas (massala chais), nutraceutic (naimitika rasayanas), etc., to achieve an integral utilization of this thousand-year-old wisdom, in benefit of the perfect health and happiness of population.

4. Vocational training as Traditional Medicine (TM) is a relevant aspect for the extension of Ayurveda. This condition must admit that the Ayurveda is a complete body of knowledge in itself, with an integral vision of the human being and his environment, different from the allopathic conventional medicine. This TM is acquired by procedures where the innate and acquired skills are developed with study and practice across the years, needing of a career of personalized formation by Vidya Teachers of Asthangayurveda. Finally, for his social and sanitary validation, it is needed the availability of a field for vocational and skill training administered by the Public Health System. Those reasons justify the imperious need to define a curricular mesh according to the needs of its practice in the country for forming Ayurvedic Naturopath, with the series of services of support and therapies, among which it is necessary information on available phytomedicines in the market, as a *sin equa non* requirement.

5. In order not to lose the momentum generated by the Seminar, the First Ayurveda-Net Round Table is advisable to organize in October 2007, with the members interested in taking part in the R&D Program on Ayurvedic Phytomedicines, with aim of defining objectives, priorities and managers, and those topics that will be defined in that occasion.

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