

**“Capacity Building and Partnership for
the Development of Plant Sciences and
Conservation of Biodiversity in Latin
America”**



**RED LATINOAMERICANA DE BOTANICA – RLB
Latin American Plant Sciences Network – LAPSN**

2004 Tyler Prize for Environmental Achievement

FOREWORD

Latin America harbors a megadiverse flora, comprising almost 25% of the World's plant species. This flora is a biological, cultural and social heritage being endangered by inadequate management tied to the paucity of scientific capacity to properly use, manage and conserve the outstanding plant biological diversity of the region.

Since 1988, the Red Latinoamericana de Botánica (RLB - Latin American Plant Sciences Network), has been engaged in capacity building, fostering the number of qualified Latin American botanists in order to adequately assess the regional vegetation, understand ecosystem functioning and to provide the basis for the conservation and management of the important natural resources offered by the Latin American flora.

This goal is being achieved by training young botanists from Latin American countries using the expertise and infrastructure available in qualified scientific institutions across the region. Through a consortium of 28 graduate training centers located in six Latin American countries (Table 1), RLB has trained 196 graduate level researchers from 18 Latin American countries as well as offered 70 short-term specialized graduate courses, which were attended by more than 1,200 students. It has also organized and funded 105 scientific events and provided 171 small grants for binational botanical research (Figure 1). A large number of former RLB scholarship holders have been promoted within their academic or administrative posts and many are now actively engaged in the training of new scientists within their home countries, further increasing the regional scientific capacity.

Results have been achieved with an extremely modest budget. Funds invested reach just over US\$ 4.2 million, raised through grants from a number of private foundations and in-kind support generously

offered by several of the network institutions (Table 2). Over 80% of the funds have been invested in substantive actions of the RLB, the rest being utilized for core operations (Figure 2). The modest but cost-effective work of the RLB is a worthwhile investment in a region in which knowledge and its policy institutionalization will be increasingly important to conserve and sustainably use the rich regional flora.

RLB's contribution has centered in areas of the utmost importance for the regional and global future: training in the field of biology, particularly focused in ecology and conservation of resources; and generating the scientific knowledge needed in order to have a major impact on environmental policy and decision-making for the maintenance, recovery and sustainable use of biodiversity throughout Latin America.

Regardless of achievements, the need to maintain and expand capacity building and networking is still a reality. Some countries have not benefited sufficiently from the opportunities offered by RLB's programs. The number and distribution of applicants to the RLB scholarships and graduate courses during RLB's existence has varied among Latin American countries. Young scholars from several countries, mainly from Central America, the Caribbean, the Tropical Andes, and the Chaco, which have scarcely benefited of RLB's activities, accounted for the scarce development of Plant Sciences in these countries (Figure 3). RLB aims to break this vicious cycle. Thus, RLB is continuously looking for the necessary funds in order to improve this situation and strength Plant Sciences over all Latin America.

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RATIONALE AND JUSTIFICATION FOR THE RLB

Latin America is a region with a remarkable biodiversity. The most widely known aspect of such biodiversity is species richness. The region contains the highest proportion of plant and animal species, and probably micro-organisms, known so far to science in the Planet. For example, just in the region comprised by Colombia, Ecuador and Peru alone, is estimated to harbor some 50,000 species of flowering plants, about one sixth of the total global diversity. This figure reaches close to 25,000 species for Mexico alone, which also supports the highest number of species of reptiles and is second, after Indonesia, in number of mammal species worldwide. In addition to species diversity, the region contains significant tracts of almost all biomes known to Earth. Along this enormous diversity of species and ecosystems, a high degree of endemism, is another feature rendering the regional biodiversity not only as the largest, but the most unique reservoir of products of the process of organic evolution that has taken place on Earth during hundreds of millions of years.

Yet, this invaluable heritage is being lost at an unprecedented rate, through a relentless process of ecosystem conversion into often very inefficient agricultural or grazing lands or due to over-exploitation. With these conversions, there is not only the reduction in the number of populations of scores of species, the majority still unknown to science, but also the immediate sequel of their extinction or the severe threat of it. Associated to the biodiversity alteration, there is a loss of good and services that all ecosystems provide for the maintenance of the conditions that support life on Earth, including human societies. This includes, among other services, the capture of rainfall and its gentle spillage to springs, aquifers and rivers which maintain the stability of the water cycle and make it available for human use; the capture of CO₂ from the

atmosphere in the photosynthetic process, helping to maintain the stability of Carbon concentration in the atmosphere; the protection of soils from erosion and wash-down slopes and streams that have caused so many ecological and social tragedies in the recent years in Latin America and the Caribbean; and the provision of countless sources of food, fiber and medicine to satisfy human needs. The list of such services is long, and only demonstrates the seriousness of the pilfering of the world's natural patrimony which human-kind is threatening.

Several causes account for biodiversity loss, including poverty, economic marginalization, undervaluing of natural resources, poor social participation in decisions regarding development and resource utilization, ignorance of which resources and where are they present in each country, among other factors. Most, if not all, of those causes relate eventually to educational constraints and societal access to the different levels of education. Indeed, there is a paradoxical contrast between biological riches and the striking scarcity of professionals solidly trained in the various fields of science^{1,2}. Developing countries, which contain close to 80% of the world's biodiversity, have only 6% of the scientists of the world².

The Latin American region is a prime example, with marked internal contrasts, which render the shortage of human scientific and technical capacity even more extreme. There were only 364 scientists/10⁶ inhabitants in 1990, as compared to 3,694 in the developed countries³. Furthermore,

¹ Raven, P. (1992). Floristic diversity of the planet and its importance for human well-being. In *México ante los retos de la biodiversidad*. Comisión Nacional para el Uso y Conocimiento de la Biodiversidad, México, D.F.

² Sarukhán, J. and R. Dirzo (2001). Biodiversity-rich countries. In *Encyclopedia of Biodiversity* (S. Levin, ed.). Academic Press, San Diego, California

³ Kalin de Arroyo M., S. Dietrich, E. Forero, and S. Maldonado (1994). The Latin American Plant Sciences Network: a collaborative regional effort in science training. In *Agroforestry Education and Training: The Latin American Perspective*

Latin American countries allocate only 0.4% of GDP to research and development, compared to 2.9% in industrialized countries³. This situation remains unchanged in recent years: Brazil, Mexico, and Chile spend 0.61% average of their GDP in research and development, while the high-income industrialized nations spend between 1.5 % and 3.8% of their GDP⁴.

The shortage of expertise in areas related to the knowledge, conservation and management of natural resources in developing countries is so limiting⁵, that in the III Conference of the Parties of the Convention on Biodiversity (held in Buenos Aires, 1996), issued a mandate to its executive bodies to find mechanisms and actions to help solve this fundamental problem. Consequently, if there is a considerable lack of knowledge in a country regarding which species are there and where they grow, the more complex understanding of how the assemblages of those species function, react to human intervention and how can be utilized rationally or be restored, at least partially, is even more unlikely to be available, hampering social development.

Regional cooperation, especially networking⁴, offers one approach to overcome those limitations. Capacity building is a shared regional and global responsibility in which leading research centers in more advanced countries should play a fundamental role in building science and technology capacity in other countries⁵.

(Krishnamurty, L., P.K.R. Nair, and C.R. Latt, eds.).
Agroforestry Systems 28, Kluwer Academic Publishers, Dordrecht.

⁴ InterAcademy Council (2004). Inventing a better future: A strategy for building worldwide capacities in science and technology. IAC Report. The Netherlands; accessible at www.interacademycouncil.net.

Simonetti, J.A. 1998. Networking and Iberoamerican biodiversity. Trends in Ecology and Evolution 13: 337.

⁵ Secretariat of the Convention on Biological Diversity (2001). Global Biodiversity Outlook. ISBN 1020-9387. 282 pp.

HISTORY OF THE RLB

Partly as a result of sharing concerns about the described scenario, a group of fellow plant scientists from several Latin American countries gathered in 1985, to discuss ways of improving the conditions that would allow young students to pursue either graduate degrees or specialized courses that will prepare them better in their fields of interest in the plant sciences, specially in the areas of ecology and resource management and conservation⁶.

In September 1987, the preliminary document "A Network of Latin American Universities in Plant Sciences", prepared by Mary T. Kalin de Arroyo, Liliana Cardemil and Sonia Machado de Campos Dietrich, was submitted to the Jessie Smith Noyes Foundation, New York. Conceptually, this proposal borrowed strongly from a previous document prepared by Sonia Machado de Campos Dietrich, following a meeting of leading South American botanists in São Paulo, May 1985. The 1985 document conceived a regional project in botany for South America along the lines of the very successful "Programa Regional de Entrenamiento de Postgrado en Ciencias Biológicas", financed by UNDP/UNESCO in the late 1970s.

As a result, and almost two decades in advance to the strategies outlined in the 2004 IAC report on building worldwide capacities in science and technology⁷, the **Red Latinoamericana de Botánica** (Latin American Plant Sciences Network), a consortium of leaders Latin American

⁶ Kalin Arroyo, M. (1988). Towards the establishment of a Latin American Plant Sciences Network. Report presented to The Jessie Smith Noyes Foundation, New York, on the meeting held at the Instituto de Botânica, São Paulo, Brazil, 30 January - 3 February 1988. 206 pp.

⁷ InterAcademy Council (2004). Inventing a better future: A strategy for building worldwide capacities in science and technology. IAC Report. The Netherlands; accessible at www.interacademycouncil.net.

institutions (Table 1), was established in 1988, aiming:

i. to increase the number of trained plant scientists in a region harboring one-third of the world's plant species, within an indigenous framework in which greater sensitivity and research relevancy to the needs of conserving biodiversity are the guiding principles.

ii. to promote the development of new centers of botanical excellence throughout the region.

iii. to reduce the critical isolation between scientists of Latin America, that has long limited the development of a regional voice to the problems of conservation and resource management.

iv. to promote a sense of scientific community, self-sufficiency and stronger and healthier international relations between the countries of Latin America.

Since its launching, on February 2nd 1988, the RLB has permanently offered an assemblage of unique and specially designed training and academic programs that have provided an opportunity to young plant scientists of the region to obtain first class academic training at different levels. These levels have covered a wide array of training modes, from short-term specialized courses for mid-career professionals working, to full support to pursue education in research-based graduate programs, including individual training for master, doctoral or post-doctoral students at highly specialized laboratories in Latin America, and attendance to high-level workshops or seminars and congresses. It has also stimulated collaborative research projects between established scientists from two or more institutions in the region.

The RLB, together with the Red Latinoamericana de Ciencias Biológicas (RELAB), which has been devoted mostly to training in Biochemistry, are the only regional mechanisms for academic interchange, student mobility in the sciences and for carrying out the often mentioned but seldom achieved South-South collaboration schemes for academic cooperation, scientific mobility and capacity building.

Achievements includes the training of 196 plant scientists from 18 Latin American countries, at doctoral, masters and short-term specialized graduate courses. Ecology and Systematics are the two most demanded areas for education among RLB fellows (Figure 4); the full or partial funding of 70 graduate courses, which were attended by more than 1,200 students of the region; the full or partial funding of 105 scientific events, including five Latin American Botanical Congresses; and over 170 small grants for research throughout Latin America. As outcome of graduate training, more than 100 scientific articles and book chapters have been published, 50% in ISI journals, as a result of activities funded by the RLB. These articles have been principally written by former graduate students, either as product of their thesis researches, or as a direct product of training supported by the RLB. Further, over 150 young scientists have had the chance to deliver papers at national and international congresses, with support from the RLB.

The majority of the former fellows have been promoted in their positions, and most of them indicate that the betterment in their professional positions was a direct result of the training received with the support of the RLB.

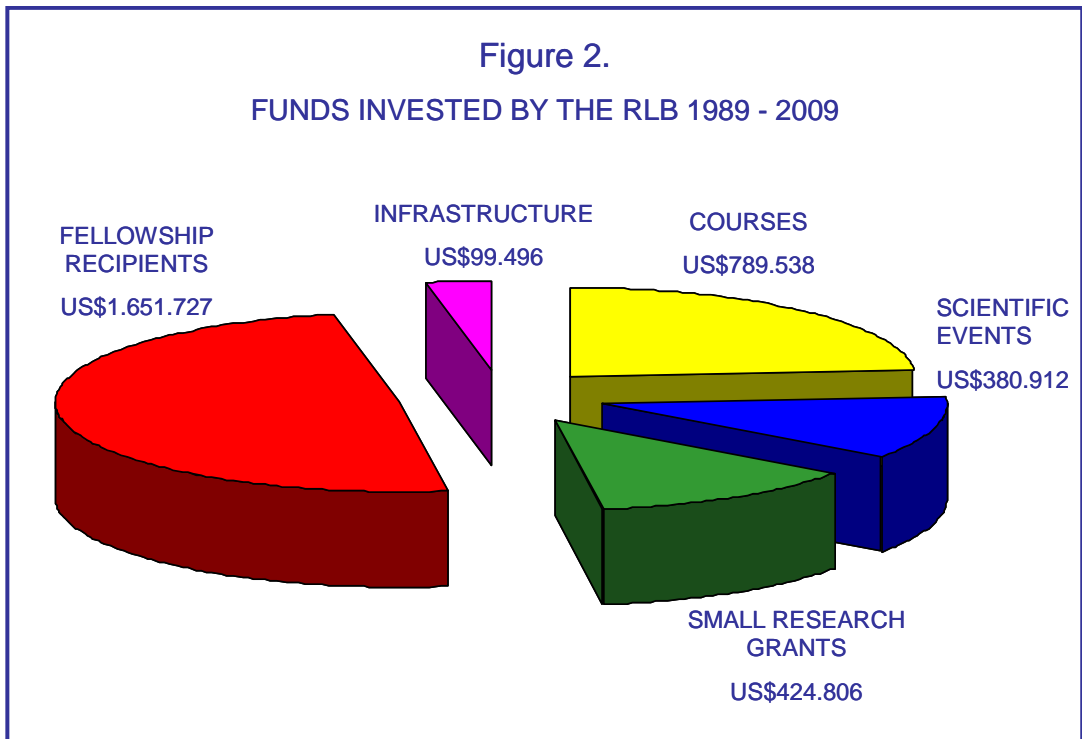
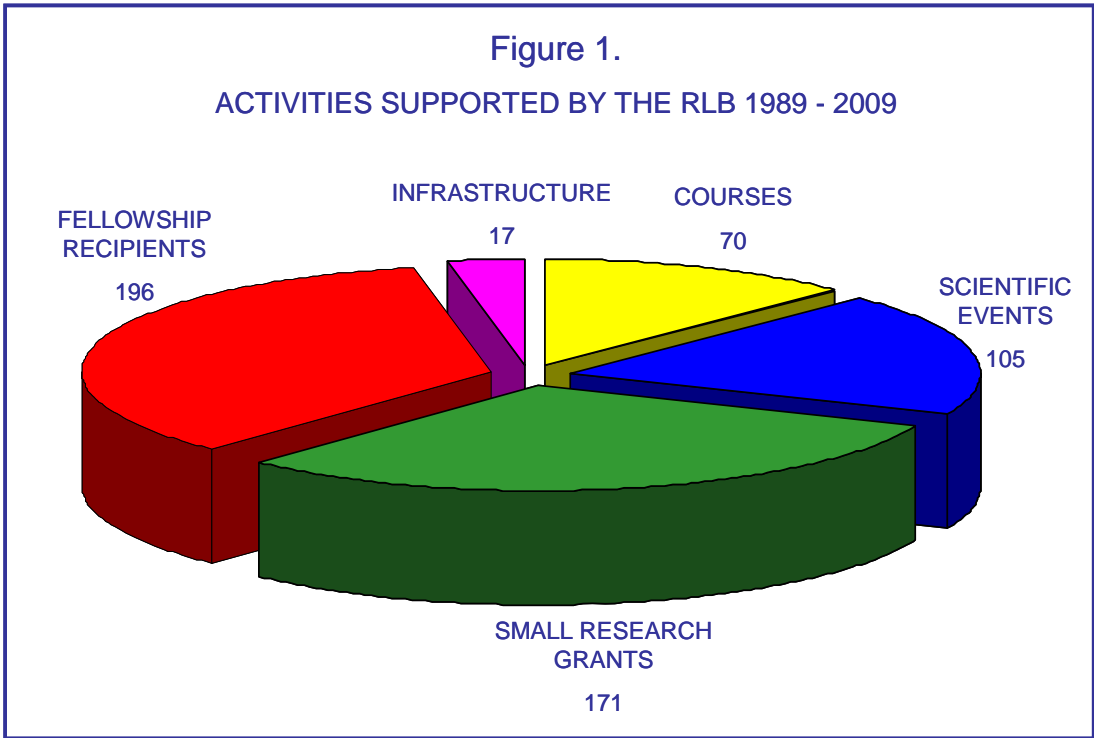
Table 1
Academic centers collaborating with the RED LATINOAMERICANA DE BOTÁNICA

COUNTRIES	INSTITUTIONS	AREAS OF EXPERTISE
ARGENTINA	1. CIRN-INTA and CICV-INTA, Buenos Aires 2. Universidad de Buenos Aires, Buenos Aires 3. Universidad de La Plata, La Plata 4. Instituto de Botánica Darwinion, Buenos Aires 5. Instituto de Botánica del Nordeste, Corrientes 6. IMBIV, Universidad Nacional de Córdoba, Córdoba	Plant Systematics Plant Physiology Biochemistry Systematic of Genetic Resources Paleobotany Biogeography Ecology
BRAZIL	7. Instituto de Botánica, São Paulo 8. Universidade de São Paulo, São Paulo 9. Universidade de Campinas, Campinas 10. Universidade Federal de Rio Grande do Sul, Porto Alegre 11. Universidad Federal de Viçosa, Minas Gerais 12. Universidade Federal de Pernambuco, Recife 13. Universidade Federal de Brasília, Brasília. 14. Escola Nacional de Botânica Tropical, JBRJ, Rio de Janeiro	Plant Physiology Biochemistry Plant Systematics Tropical Rainforest Phytosociology Coastal Plant Resources Plant Anatomy Palinology Conservation
CHILE	15. Universidad de Chile, Santiago 16. Pontificia Universidad Católica de Chile, Santiago 17. Universidad de Concepción, Concepción 18. Universidad Austral de Chile, Valdivia 19. Universidad de La Serena, La Serena	Plant Ecology Plant Physiology Plant/Animal Interactions Plant Taxonomy Marine Ecology Phycology Biogeography Palinology Conservation and sustainable use
COSTA RICA	20. Universidad de Costa Rica, San José	Molecular Biology Biochemical and Molecular Characterization of Plant Genomes Plant Biology
MEXICO	21. Universidad Nacional Autónoma de México (UNAM), Mexico D.F. 22. Colegio de Posgraduados, Montecillo 23. Centro de Investigación y de Estudios Avanzados del IPN, Irapuato 24. Instituto de Ecología, A.C., Xalapa. 25. Centro de Investigación Científica de Yucatán, A.C.	Tropical Plant Ecology Plant/Animal Interactions Genetics of Plant Populations Plant Physiology Ethnobotany Plant Systematics Conservation Biology
VENEZUELA	26. Instituto Venezolano de Investigaciones Científicas (IVIC), Caracas 27. Instituto de Ciencias Ambientales y Ecológicas (ICAE, ex CIELAT), Universidad de Los Andes, Mérida 28. Universidad Central, Caracas	Tropical Plant Ecology Ecophysiology Dynamic of Ecosystems Tropical Agroecosystems

Table 2

Major grants awarded to RED LATINOAMERICANA DE BOTÁNICA since 1987.

Period	Received from	US\$
1987	Jessie Smith Noyes Foundation, USA	17,000
1988-89	Jessie Smith Noyes Foundation, USA	100,000
1988-89	Rockefeller Foundation, USA	300,000
1988-89	W. Alton Jones Foundation, USA	100,000
1988-91	Andrew W. Mellon Foundation, USA	300,000
1990	Compton Foundation, USA	25,000
1990-91	W. Alton Jones Foundation, USA	100,000
1990-93	Agency for International Development, USA	67,000
1990-93	John D. and Catherine T. MacArthur Foundation, USA	300,000
1991-92	Rockefeller Foundation, USA	350,000
1992-95	Rockefeller Foundation, USA	350,000
1993-96	Andrew W. Mellon Foundation, USA	300,000
1994-96	John D. and Catherine T. MacArthur Foundation, USA	255,000
1997-2000	Andrew W. Mellon Foundation, USA	340,000
1999-2001	John D. and Catherine T. MacArthur Foundation, USA	110,000
1999	William & Flora Hewlett Foundation, USA	10,000
2000-03	William & Flora Hewlett Foundation, USA	300,000
2002-05	Andrew W. Mellon Foundation, USA	340,000
2004	2004 Tyler Prize for Environmental Achievement	100,000
2005	The Alice C. Tyler Perpetual Trust	30,000
2005	The Alice C. Tyler Perpetual Trust	23,190
2006-08	Andrew W. Mellon Foundation, USA	260,000
2006	The Alice C. Tyler Perpetual Trust	30,000
2007	The Alice C. Tyler Perpetual Trust	30,000
2007	Organization of American States (OAS)	38,700
2008	The Alice C. Tyler Perpetual Trust	30,000
2008	Organization of American States (OAS)	63,940
2009	The Alice C. Tyler Perpetual Trust	50,000
2009	Organization of American States (OAS)	126,327
2010-11	Andrew W. Mellon Foundation, USA	85,000
2010	Organization of American States (OAS)	65,130
		4.596.287



ORGANIZATION AND GOVERNANCE

The RLB is a consortium of a select number of academically prestigious institutions located in Mexico, Costa Rica, Venezuela, Brazil, Chile, and Argentina, with headquarters at the University of Chile, Santiago, Chile. Internationally recognized academics of these Institutions collaborate to offer courses and mentor graduate students. These Institutions (Table 1) are also *foci* to organize regional specialized courses and scientific meetings, as well as to execute bi- and multi-national research projects.

Concerning its basic structure and scope, RLB has always been an integrated network with a high degree of South-South connections⁸. Governance is provided by an Executive Committee, selected among peers and serve for fixed periods. This committee consists of a President, the Past President, four distinguished plant scientists (three of them are from a collaborating centers and one representative from a scientifically less developed country) and the Executive Director (*ex-officio*) (Table 3). In addition, the RLB operates with a Scientific Committee, composed of the Executive Committee (except for the Executive Director) plus faculty members representatives of most of the collaborative Latin American training RLB centers (Table 3).

The Executive Committee and the Scientific Committee meet once a year and every two years in a Latin American country to discuss policy and budgetary matters, to program major graduate courses and symposia, and to review applications for fellowships or other supports.

An External Advisory Committee assists the RLB. It includes Past Presidents, some distinguished scientists, the President of the Latin American Botanical Society (ALB), and the President of the Latin American Academy of Sciences (ACAL).

The financial resources provided by private foundations are administrated through the nonprofit Chilean organization "Corporación para el Desarrollo de las Ciencias Vegetales en América Latina", created on March 21st, 1991. The objective of the Corporation is to contribute to the development of plant sciences in Latin America. The Corporation does not pursue or propose any profit-oriented objectives. It consists of scientists, most of which are also part of the RLB. The Corporation's board of directors consists of a President, a Secretary, and a Treasurer. No remuneration is received by any member of the Corporation for the accomplishment of his or her duties.

Current RLB administrative staff is comprised of only one person, the executive secretary, who is hired by the Corporation to serve her position. However, distinguished Latin American scientists serve all the other functions within RLB's Executive and Scientific Committees without receiving any payment.

⁸ Kalin de Arroyo M., S. Dietrich, E. Forero, and S. Maldonado (1994). The Latin American Plant Sciences Network: a collaborative regional effort in science training. In *Agroforestry Education and Training: The Latin American Perspective* (Krishnamurty, L., P.K.R. Nair, and C.R. Latt, eds.). Agroforestry Systems 28, Kluwer Academic Publishers, Dordrecht.

Table 3

Red Latinoamericana de Botánica: Board members and staff 2007-2010

Executive Committee

Javier A. SIMONETTI, President
Chile

Victoria SOSA, Mexico

Sonia LAGOS-WITTE, Costa Rica

Lohengrin CAVIERES, Chile

Gloria MONTENEGRO, Past President
Chile

Mónica MORAES, Bolivia

Paulina CHACON, Executive Director

Ariane L. PEIXOTO
Escola Nacional de Botanica Tropical,
JBRJ, RJ, Brazil

Gloria MONTENEGRO
P. Universidad Católica de Chile, Chile

Felipe HINOJOSA
Universidad de Chile, Chile

Lohengrin CAVIERES
Universidad de Concepción, Chile,

Ana ANTON
Universidad Nacional de Córdoba,
Argentina

Scientific Committee

Helga OCHOTERENA
Instituto de Biología-UNAM, Mexico

Neftalí OCHOA
CINVESTAV-Irapuato, Mexico

Victoria SOSA
Instituto de Ecología A.C., México

Juan NÚÑEZ
Instituto de Ecología-UNAM, México

Sonia LAGOS-WITTE
Universidad de Costa Rica, Costa Rica

Lina SARMIENTO
ICAE - ULA, Venezuela

Paulo T. SANO
Universidad de São Paulo, Brazil

Lilian ZAIDAN
Instituto de Botanica, São Paulo, Brazil

José PARUELO
Universidad de Buenos Aires, Argentina

Cristina TELLERIA
Universidad Nacional de la Plata,
Argentina

External Advisory Committee

Mary KALIN, Past President, Chile
Luis CORCUERA, Past President, Chile
Sonia DIETRICH, Past President, Brazil
José SARUKHÁN, Past President, Mexico
Osvaldo SALA, Past President, Argentina
Peter RAVEN, USA
Gabriel MACAYA, Costa Rica
Sir Ghilleen PRANCE, UK
Daniel PIÑERO, Mexico
Arturo GÓMEZ-POMPA, Mexico/USA
Francisco SQUEO, President ALB, *ex officio*
President ACAL, *ex officio*

Staff

Paulina CHACON, Executive Director

Figure 3.

COUNTRY OF ORIGIN OF RLB SCHOLARSHIP HOLDERS 1989 - 2009

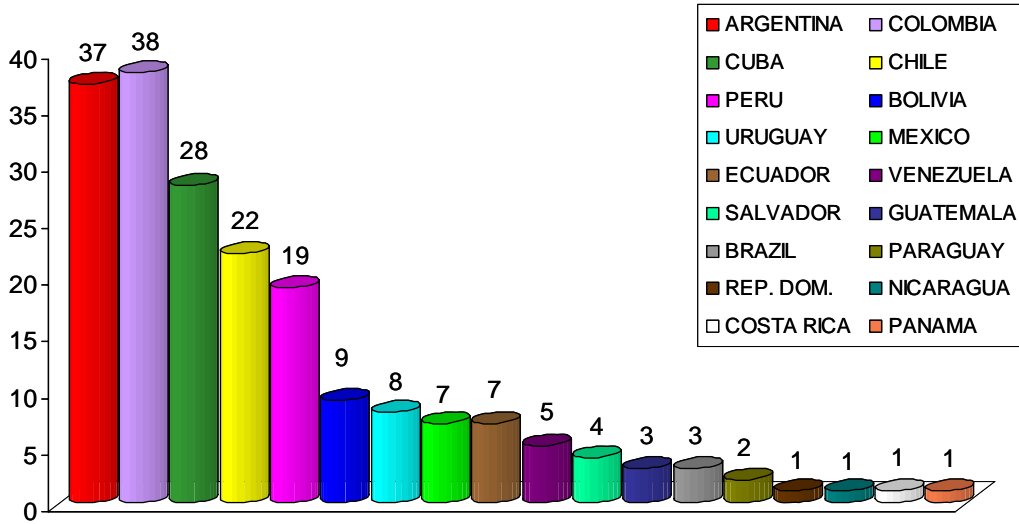
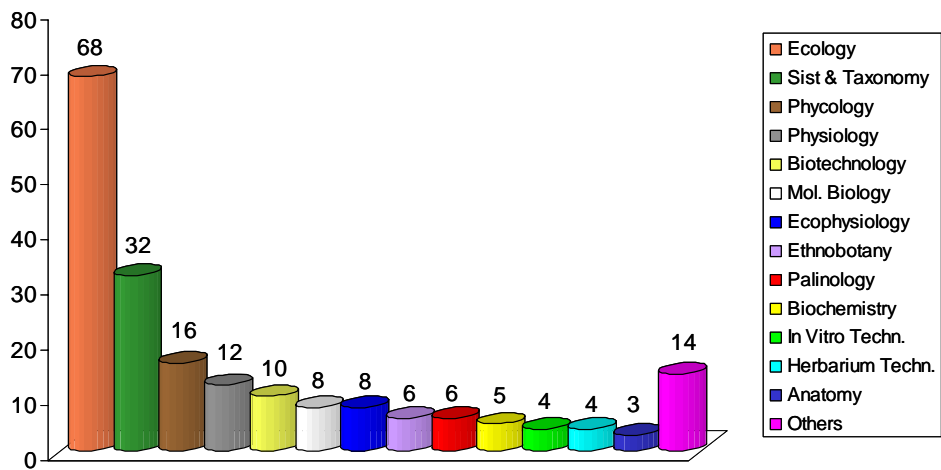


Figure 4.

AREAS OF PLANT SCIENCES CHOSEN BY RLB SCHOLARSHIP HOLDERS 1989 - 2009



Others: Genetics, Phytopatology, Virology, Dendrochronology, Cytogenetics

In credit to its expertise in capacity building, partnership and networking for conservation and sustainable use of resources, RLB was invited to participate in the project funded by Global Environment Facility (GEF)/ United Nations Environment Programme (UNEP) "Promoting Best Practices for Conservation and Sustainable Use of Biodiversity of Global Significance in Arid and Semi-Arid Zones" implemented by TWNSO (Third World Network of Scientific Organizations). Furthermore, TWNSO selected RLB as one of only three examples of successful initiatives in sharing in Sciences and Technology in the Southern Hemisphere⁹.

In 2002, the Latin American Botanical Association (ALB) recognized RLB as a major promoter and supporter of the Latin American Congresses and the development of the Botany in the whole Latin American region. Current progress in plant sciences in the region is closely linked to initiatives and projects resulting from discussions carried out during these congresses. A number of groups with special research interests have emerged from them, such as the Latin American and Caribbean Association of Botanical Gardens, the Latin American Ethnobotanical Group (GELA), and the Latin American Phenological Network.

More recently, RLB was honored with the 2004 Tyler Prize for Environmental Achievement, by the "unprecedented program of courses, student exchanges, and collaborative research projects and especially by promoting regional pride, self-sufficiency and strong and healthier international relations among the countries of Latin America".

⁹ Maldonado, S., O. Sala, and G. Montenegro, 2002, "Latin American Plant Sciences Network: A Program for the Development of Plant Sciences and Conservation of Biodiversity in Latin America", in *Conserving Biodiversity in Arid Regions: Best Practices in Developing Nations*. Edited by John Lemons, Reginald Victor, Daniel Schaffer. Kluwer Academic Publishers, Boston, July 2003, 520 pp., ISBN 1-4020-7483-2

ACTIVITIES OF THE RLB

Activities supported by the RLB adhere to the following basic principles¹⁰: (a) maximization of the transfer of plant-science knowledge from well-trained individuals from one Latin American country to the citizens of another, particularly to younger individuals (horizontal connections); (b) necessity of greater comprehension of environmental and developmental problems at a regional level; (c) necessity to offer incentives for research relevant to local problems; (d) necessity to encourage young Latin Americans to remain in the region once trained; (e) maintenance of diversity rather than a standardized curriculum; and (f) necessity for vertical connections by which activities are temporally linked with new initiatives building on previous ones.

Within this framework, training is the focal activity. Through its training program, RLB supports students at the Doctoral, Masters, and short-term training levels to undertake their studies in collaborating institutions. In order to reduce isolation and to increase dissemination of knowledge about plant sciences, RLB does not support students to study in their own countries. Students are awarded travel, monthly stipend, tuition fees, and research help to study within Latin America.

Another important activity organized by RLB are regional graduate courses, most of which are related to the conservation of biodiversity. These are designed to overcome deficiencies and develop more integral approaches. Emphasis is on theory and analytical skills. RLB, through consultation with key scientists in the region, searches for topics where knowledge is changing very quickly and teaching requires a coordinated effort. Once the topic has

¹⁰ Kalin de Arroyo M., S. Dietrich, E. Forero, and S. Maldonado (1994). The Latin American Plant Sciences Network: a collaborative regional effort in science training. In *Agroforestry Education and Training: The Latin American Perspective* (Krishnamurty, L., P.K.R. Nair, and C.R. Latt, eds.). Agroforestry Systems 28, Kluwer Academic Publishers, Dordrecht.

been identified, RLB appoints a coordinator to organize a two-week long course, generally attended by 15 to 20 Latin American students, which are also fully supported by RLB.

Equally important is the organization of major symposia on emerging and cross-cutting topics relevant to the region. The purpose of all these meetings is to identify research priorities and opportunities for collaboration at national, regional and international levels. Partial support, on a competitive basis, is also offered to facilitate the attendance of Latin American scientists to international scientific meetings.

RLB also plays a role improving information exchange. To cope with increased need for advertisement and communications, a quarterly electronic newsletter "RLB Boletín Informativo" has been published from 1994. This bulletin covers RLB news, and serves for disseminating copious information arriving at the RLB headquarters to the Latin American botanical community at large. The site "<http://www.rlb-botanica.org>", that added a new dimension to the RLB information system in 1996, contains links to the information on the RLB's collaborating institutions, and on Latin American researchers and academic staff in plant sciences and any other information relevant to the botanical community in Latin America.

Opportunities of RLB are offered on a competitive basis, with academic excellence and the needs of individual countries being the principal selection criteria. RLB does not discriminate on any basis, be it political or

religious affiliation, race, sex nor physical condition.

FUNDING

Historically, funding has been mostly dependent on external donors (Table 2). Besides aids from foreign private foundations, matching funds are also raised in Latin America. Significant financial support has also been granted by collaborating institutions, towards the support of diverse activities such as support of faculty travel, lodging facilities for participants in courses or Scientific Committee meetings, infrastructure and equipment for courses, scientific events and meetings, salaries for teachers of regional graduate courses, and most important, partial tuition waiver of fees for scholarship holders.

Currently, RLB is engaged in diversifying its funding sources. Along this line, current efforts are allocated to establish an endowment fund. Private companies are expected to contribute to this endowment, which when fully established might defray a significant fraction of academic and operating costs of RLB. Further, RLB is seeking support from individuals. Donations to RLB by private citizens, including former RLB fellows, is regarded as a demonstration of the relevance of RLB activities in the region, further enhancing fund raising with donor agencies worldwide. Additionally, RLB is considering offering services to third-parties, generating a source of revenues to support its academic activities. It must be pointed out that all faculty members serving any position within or contributing to any RLB activity perform their duties *pro bono*.

CONCLUSIONS

By any standards, RLB is a relatively modest enterprise. However, it provides a good example of what can be accomplished with a relatively small budget when there is strong commitment to the cause. The economically modest but cost-effective work of the RLB is a worthwhile investment in a region in which knowledge and its policy application will be increasingly important elements in the face of the present pressures for the conservation and sustainable use of biodiversity, and where national investment in science and technology must be stimulated.

Latin America is a region whose hopes of a better, more egalitarian and socially just future depends totally on their having a growing number of better-trained women and men.

The contribution that the RLB has made in this sense, however modest, has centered in areas of the utmost importance for the future of the region as well as globally. These are: the training in the field of the biology, particularly focused in the area of ecology, food production and conservation of natural resources; and generating the scientific knowledge needed in order to have a major impact on ecological policy and decision making for conservation, that is the maintenance, recovery and sustainable use of biodiversity throughout Latin America.