



# **PLANT ENDEMISM OF THE CENTRAL ANDEAN VALLEYS, BOLIVIA**

**DARWIN INITIATIVE ANNUAL REPORT**

**DEPARTMENT OF PLANT SCIENCES  
UNIVERSITY OF OXFORD**

## 1. Darwin Project Information

Project Title: Plant Endemism of the Central Andean Valleys of Bolivia

Country: Bolivia

Contractor: Department of Plant Science, University of Oxford

Project Reference Number: 162/11/010

Grant Value: £187,866

Start/Finishing dates: 1 October 2002-30 September 2005

Reporting period: 1 October 2002-30 April 2003

## 2. Project Background

Most attention and biodiversity research in Bolivia has been centred on the moist tropical forests in the Andean foothills and Amazonian lowlands, and it is in these areas that most protected areas are located. The essential premise of the project is that the drier, central Andean valleys are relatively neglected both in terms of research and conservation and that they contain rich biodiversity and important centres of plant endemism. The area of the project's work is essentially the Andean basin of the Rio Grande and its tributaries and a series of inter-Andean valleys lying between this area and the Peruvian border.

This area contains several of the country's major centres of population including Cochabamba and the legal capital, Sucre, while the two largest towns, La Paz and Santa Cruz lie at the edge of the project area. While this clearly increases the potential threat to the biodiversity of the project area and the urgency of identifying key areas for protection, it also means that all four established herbaria, our partner institutions in Bolivia, have a close interest in our area of study. These institutions are all relatively new and have few resources. They have almost no tradition of taxonomic research, which has been almost the preserve of non-Bolivians to this day.

The project essentially works in Bolivia for the six-month period, November-April each year. This coincides with the rainy season when significant plant collecting is practical. UK training is planned to take place in the May-October period when project activities within Bolivia are minimal.

## 3. Project Objectives

- Project Purpose: to identify hotspots of plant endemism in and around the central Andean valleys of Bolivia for future conservation.

Project Output 1: List/Data base of as many endemic plants as possible with distribution maps.

Project Output 2: Six Bolivians able to identify species in six major families or groups.

Project Output 3: Attractive popular field guide to selected plants with emphasis on endemics.

Project Output 4: Production of posters on value and conservation of selected species/habitats.

- There have been no changes in either the objectives nor in the operational plan except that the workshop on botanical illustration scheduled in the “Key Milestones” of the Project Schedule for March/April 2003 has been postponed till February next year. As this remains within the same financial year, no permission was requested from the Darwin Secretariat. This change was made for a variety of reasons but principally because we felt it too early in the project’s life to make an informed decision on who should attend the workshop, what plants should be illustrated and where they could be found. The exact timing of the workshop is related to seasons in Bolivia.

#### **4. Progress**

- Although this report follows the annual report format as required by the project schedule, the project, in fact, began on 1 October 2002 and has been operational for little more than six months. The information presented here thus covers the whole period of the project’s life since its beginning.
- Essentially the project start-up has gone ahead smoothly and according to plan. Our field co-ordinator, John Wood, arrived in Bolivia on 1 November as planned. Selection of project co-workers took slightly longer than expected, especially in one of the four institutions (Sucre), where candidates were out of Bolivia on other courses during the planned selection period. However three of the four institutions had selected project staff before the end of December 2002 and this had been completed in Sucre by the end of February 2003. The procurement of key equipment went ahead without problems. Field equipment and cameras were brought from Britain, the project vehicle was acquired at the beginning of December and all participating institutions had computers and printers installed and functioning by early January. All four participating herbaria received donations of substantial amounts of herbarium paper and folders and individual herbaria received herbarium cupboards, compactors and freezers according to their needs and requests. The project was able to meet all reasonable requests within the reporting period. Workshops on the use of digital cameras and the BRAHMS data base were given in January-February 2003 and all four institutions have entered all new data into the data base and all have an increasing bank of images, which will be a vital asset in future publications and publicity. Field work began in December 2002 and over 1600 specimens had been collected from the project area by the end of April 2003. Some of this material has been identified but much remains to be done. All project workers have received substantial on-the-job field and herbarium training.
- Selection of project workers was carried out in similar fashion in all four institutions. The work was advertised within the university. Applications were reviewed by our field co-ordinator and the institution head and those short-listed were interviewed jointly. References were followed up where practical. Essentially we were looking for qualified staff associated with each herbarium, who had the time available to work with the project, willingness to do field work and some successful track record in plant taxonomy. All six selected workers (one from La Paz, one from Santa Cruz, two from Cochabamba and two from Sucre) are, in fact also involved in the Checklist for the Bolivian Flora. During the interview process we considered part-time involvement in other taxonomic research projects as positive since evidence of long-term commitment to plant taxonomy was an important pre-requisite. All selected project workers

participated in the data basing and digital photography workshops, which each lasted two days (the former in each institution). While all have worked together with our field co-ordinator in the field and the herbarium, all, in fact, enjoy a substantial degree of autonomy and are strongly encouraged (and financially supported) to undertake field work independently. The project has also given field and data-base training to another five, less experienced staff in the herbaria, selected by our co-workers, with the purpose of widening the pool of trained herbarium workers and providing support to our co-workers in their institutions.

- It is difficult to evaluate our progress in identifying centres of plant endemism in Bolivia's central valleys, partly because so much material is yet to be fully identified and partly because of a surfeit of endemic plants in the few families where we can make reasonably accurate identifications. Few days and no major field trip passes without finding something that is apparently new to science and, therefore, presumably endemic as well. One of our best days was in early April crossing the Rio Grande from Villa Serrano to Vallegrande in the very heart of the project area. In a single day we found around 15 plants which were new to us all including an *Amaranthaceae*, already pronounced to be new by the German expert in the family present in Bolivia at the time, and two *Asclepiadaceae* which are likewise almost certainly new. My two Bolivian companions and I felt the exhilaration of repeatedly finding unknown plants in almost every place we looked.
- No significant difficulties were encountered during the year. There was considerable civil unrest in Bolivia during January and February 2003 but we maintained our programme by limited use of air transport to avoid road blocks.
- No refinements for the project have been made in the past year. We believe the original design including indicators was essentially sound although the goals are ambitious given the size of both Bolivia's central valleys and their flora. Our only changes involve postponing the training in botanical illustration till later in this financial and delaying the arrival of the first Bolivians to study in the UK until 2004 (see below). In both cases this is to enable better selection and preparation of training.
- Timetable for next reporting period:
 

May-September 2003	Project essentially in recess with part-time work in UK and Bolivia on the identification of specimens and entry and editing of information in the data bases.
October –April 2004	Return of John Wood to Bolivia (replaced by Colin Hughes in December-January) and the re-initiation of field work in the project area to coincide with the rainy season. Throughout this period the bank of specimens, data and images will be built up in all partner institutions.
October 2003	One week's workshop in La Paz for all project workers led by John Wood and Stephan Beck on plant identification.
January 2004	Second workshop on plant identification (mainly Leguminosae) led by Colin Hughes
February 2004	Workshop on plant illustration by Rosemary Wise followed by selection of illustrator for UK training and start of preparation of project posters.
Early 2004	Visit by Denis Filer to advance data base work, incorporating software for mapping etc with workshop in each centre.

February 2004

Selection of 3-4 Bolivian co-workers for UK training in the May-October 2004 period.

This proposed work plan for the next 12 months fully conforms to the original project proposal and schedule except that we are planning to start UK training in May 2004 instead of May 2003. The original proposal to begin training in Britain after only six months of the project life was clearly wrong. No co-worker had been involved with the project for more than four and a half months (the two from Sucre for a much shorter period), two had other commitments in the May-October 2003 period, and most had not firmly identified a group or family to work with. Only one person (Moises Mendoza) had any good familiarity with his group in Bolivia and he was committed to other work in the May-October period. At the time of writing the chosen specialities are as follows: Moises Mendoza (Umbelliferae, Araliaceae and Cactaceae), Teresa Ortuno (Cactaceae), Magaly Mercado (Labiatae), Margoth Atahuachi (Leguminosae), Alain Carretero (Cactaceae and Euphorbiaceae), Hibert Huaylla (Ferns and a group of woody plants to be identified). In almost all cases decisions on specific projects need to be identified.

## **5. Partnerships**

- Collaboration between Oxford University and our four partner institutions (Herbario Nacional de Bolivia, La Paz, Herbario Forestal “Martin Cardenas”, Jardin Botanico, Cochabamba, Herbario del Oriente, Museo “Noel Kempf Mercado”, Santa Cruz and Herbario de Chuquisaca, Sucre) has been constant and excellent throughout the reporting period. All four institutions participated in the selection process for project workers, all made adequate and appropriate space available for the project and its equipment and all have signed (or in one case are in the process of signing) agreements with Oxford. There have been no problems with the release of staff for field work, workshops etc and in general all institutions have been supportive of the project.
- We have no links with similar projects in Bolivia and are not aware of anything with similar objectives. All project workers are involved with the “Checklist of the Bolivian Flora” project funded by Missouri Botanic Garden and we have helped in the identification of material for the “Amboro-Madidi corridor” biodiversity project.

## **6. Impact and Sustainability**

- The project is new in Bolivia and efforts so far have been concentrated on establishing the project rather than raising its profile. It is clearly well known in its partner institutions and reports were submitted in April to the Direccion General de Biodiversidad (DGB) and the Servicio Nacional de Areas Protegidos (SERNAP) so that national authorities concerned with conservation are aware of its activities. An exhibition of the project’s initial activities is planned for Cochabamba in June this year. It is too early in the project’s life to assess impact.

## **7. Post-Project Follow Activities**

Not applicable

## **8. Outputs, Outcomes and Dissemination**

- **Table 1. Project Outputs**

Code No.	Quantity	Description
6	10 Bolivian botanists	Workshop on data basing collections using BRAHMS given for 2-3 days in all 4 Bolivian partner institutions
6	5 Bolivian botanists	Workshop on digital photography totalling two days given for principal project co-workers
8	27 weeks	This consists of 2 weeks work by Denis Filer to install BRAHMS and train staff in its use and 25 weeks by John Wood to set up and administer the project, carry out field and herbarium work and train co-workers in field and herbarium techniques.
12	4	Each partner institution has a working data base set up and functioning with approximately 2500 entries at present
20	£8500 approx	Each institution has received computers, software (including software for BRAHMS data base), printers, herbarium paper and folders and field equipment (GPS, secateurs, hand lenses, trowels etc). Herbarium cabinets (3), compactors (3), freezer (1), digital cameras (2), presses (5) and miscellaneous furniture (computer table etc) and equipment (machete, leather gloves) have been handed over where requested and needed. The project vehicle and some other equipment remains in project hands
23	2 free return BA flights	Two flights (London-Sao Paulo return) were donated by BA. These represent a saving to the project of around £700

As explained earlier the planned illustration workshop was postponed but instead we were able to carry out a workshop on digital photography. Two free flights were obtained. Essentially we were able to achieve all expected outputs.

- **Table 2: Publications**

Type	Detail	Publisher	Available from	Cost
Newsletter	Wood, J.R.I. The Darwin Initiative Project in Bolivia. <i>Oxford Plant Systematics</i> 10: 5-6 (2003)	Department of Plant Sciences, University of Oxford, South Parks Road, Oxford, OX1 3RB	Publisher "serena.marnier@plant-sciences.oxf.ac.uk"	Free

- **Dissemination Activities**

None as yet

## 9. Project Expenditure

- **Table 3: Project expenditure (to 30/04/03)**

Item	Budget	Expenditure

Note that figures above are somewhat approximate because of exchange rates and incomplete data at the time of writing but are very close to the real situation. It was agreed with the Darwin secretariat to transfer £1000 from the salaries budget in 2002/3 to 2003/4 and £1500 from the travel budget in 2002/3 to 2003/4 but to increase the capital budget to £20500. These changes were necessary because of the delay in employing some local staff in Bolivia in the first few months of the project and by our success in obtaining support from BA for international flights.

## 9. Monitoring, Evaluation and Lessons

- Monitoring and evaluation is both qualitative and quantitative. Training is evaluated by observation of how those trained perform in their tasks: Can they enter and retrieve information from the data bases? Can they take good quality digital photographs? Is the quality of their collections and their field data adequate and improving? We also evaluate the number of plant collections (1500+), the number of digital images stored on the computer ((300+) and the number of data entries. Initiative and morale can be evaluated by the number of independent field trips carried out, the number of specimens identified etc. All these activities will contribute to the project outputs (posters, field guides, scientific publications) as well as creating a sound scientific base for the reports and proposals to be presented to the Bolivian authorities as part of the project purpose.
- Probably the main thing that we have learnt from the year's work is the daunting task we face in completing all aspects of the project. The geographical area, the quantity of field work needed and the amount of data to be processed are all huge. It is clear that we will need to be well-focussed on the project's objectives if we are to achieve all that the project has set out to do.

John R. I. Wood

9 May 2003

Logical Framework

<b>Project summary</b>	<b>Measurable indicators</b>	<b>Means of verification</b>	<b>Important assumptions</b>
<p><b>Goal</b></p> <p><i>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention</i></p>		<p>1 Legislation/Regulations related to conservation, biodiversity and education</p> <p>2. Reports by the Direccion Nacional de Biodiversidad and other relevant bodies</p> <p>3. Media reports on public attitudes to conservation issues</p> <p>4.Data on habitat and species loss</p>	<p>1 Public support for conservation is maintained</p> <p>2.Rural poverty is progressively eliminated</p> <p>3. Government regulation is effectively implemented</p>
<p><b>Purpose</b></p> <p>To identify centres of plant endemism in and around the central Andean valleys of Bolivia for future conservation</p>	<p>1 Number of key sites/zones identified</p> <p>2 Number of endemic species accurately named for each site/zone</p> <p>3 Enhanced public awareness of and support for the conservation of endemic species</p>	<p>1. Reports submitted</p> <p>2. Proposed conservation measures by local/national authorities</p> <p>3 Sale of project guides, calendars etc</p> <p>3. Media reports</p>	<p>1. Staff available for field work in Bolivia</p> <p>2. Plants can be accurately named</p>
<p><b>Outputs</b></p> <p>1. List/Data base of as many endemic plants as possible with distribution maps</p> <p>2.Six Bolivians able to identify species in six major families or groups</p> <p>3 Attractive, popular field guide to selected plants with emphasis on endemics</p> <p>4. Production of posters on value and conservation of selected species/habitats</p>	<p>1.Existence of data base for consultation by relevant organisations</p> <p>2. Species and geographical coverage of data base</p> <p>3 Number of Bolivians successfully completing training</p> <p>4 Existence of field guide and posters</p>	<p>1 Examination of final documents including data base, field guide and posters.</p> <p>2 Number of specimens identified by Bolivians trained in project</p> <p>3. Publications by Bolivians trained</p> <p>4 Project reports</p>	<p>1. There is time to assess a representative range of sites with endemic plants in different seasons</p> <p>2. Bolivian staff reach a sufficient level in their training</p> <p>3 Experts are available and willing to identify specimens where appropriate</p>
<p><b>Activities</b></p> <p>1. Training of Bolivians in data bases, field collecting, herbarium identification and the preparation of botanical illustrations and photos.</p> <p>2. 6 x UK training in systematics of specific groups.</p> <p>3. Field collecting</p> <p>4 Enhanced capacity in Herbario Nacional with equipment and bibliography</p>		<p>1. Project reports</p> <p>2. Number and quality of specimens collected and illustrated</p> <p>3. Number of Bolivian staff able to use data base</p>	<p>1 Suitable candidates for training are available</p> <p>2 Bolivian staff are given time for training and field work.</p> <p>3 Bolivian staff are available for field work</p>