Title: Ecology of the Andes

Description: Field course on ecology of the Andes in Plant Biology at Ohio University

**Field Course: Ecology of the Andes in Northern Bolivia (H2)**

Fall-Winter Intersession (Nov. 21 to Dec, 13, 2000)

**Student Reflections (H3)**

**Landing in La Paz** (Nov. 21-23, 2000): After traveling since 3 p.m. the previous afternoon, our arrival at 7:40 a.m. in the capital city of La Paz left us exhausted and a little grumpy. We spent the first two days acclimating to the high altitude and the bustle of the city, and the onslaught of Spanish (not to mention tooth-brushing with bottled water, no fresh salads, electrifying showers...).

Student Reflections: **Amy McClintic**; **Claudia Segovia-Salcedo**; **Inna Birchenko** [each names links to page with their name]

**Coroico: Montane Cloud Forest** (Nov. 24-29): This hair-raising bus drive east over the high Andes and down the infamous Coroico Road left us speechless. The incredible hacienda hanging off the mountain slope at Hostal Kory, with its spectacular daily vista, was a great first "home base."  This mid-elevation region was our first introduction to some tropical plant families and the sheet-like marine red alga *Hildenbrandia* (growing in freshwater streams!).

Student Reflections: **Lorena Brown** [each names links to page with their name]

Day Trips to Unduavi/Chuspipata: "Paramo" Forest and Puna (Nov. 30-Dec. 2): Lodging in La Paz by night, we made daily bus trips eastward, through the frigid high mountain pass of La Cumbre to reach different paramo-like forest sites and puna sites, where we studied high-elevation plants, sampled algae and violet populations, and made faces at the llamas. Dr. Stephan Beck, Director of the National Herbarium, provided us a guest "field lecture" during one of our day trips.

Student Reflections: **David May** [each names links to page with their name]

Sorata: Moist Puna (Dec. 4-8): A several hour drive led us to the village of Sorata, nestled deep in a valley of the northern Bolivian Andes. Lodging at the Residencial Sorata, where our rooms opened out onto a huge, diverse garden, we made daily truck trips up into the highlands for algae and pincushion violets. One work day in the puna above a striking "paramo"-puna transition was cut short by a flash hailstorm. We suffered a cramped truck bed under a leaky tarp by sharing chocolate, cookies and 3 flavors of Pringles potato chips.

Student Reflections: **Bryan Rayo**; **Amanda Habel** [each names links to page with their name]

Copacabana: Dry Puna (Dec. 9-10): Chaos reigned supreme in getting our rooming situation settled at the Hotel Ambassador. The highlights of our brief stay in this pretty lakeside village were boat trips to the Isles of the Sun and Moon to see remnants of the Incan culture, and the delicious lake trout. On our drive back to La Paz, we discovered (and studied) a site where two pincushion violets were hybridizing. So exciting!

Student Reflections: **Aurea Cortes**; **Jeremy McKinney**; **Angelo Giallombardo**

Wrap up in La Paz (12/11-12)--We finished our research collaborations with the National Herbarium folks who helped make the trip run smoothly, did our last flurry of shopping for those essential souvenirs (or gifts to ourselves), and prepared for our return home.

**Fall-Winter Intersession (Nov. 21 to Dec, 13, 2000)** **(H3)**

**PBIO 369F (#04536), PBIO 693 (#04564)**

**Purpose of the Course:** To teach students about the vegetational ecology, flora and human-environment interactions of the central Andes, exploring aspects covered in the Fall quarter introductory seminar. Field studies will cover both terrestrial and aquatic systems. Stress will be placed on observations of vegetation structure, characteristic life forms and recurrent morphological adaptations, climatic and ecological influences maintaining vegetation and aquatic systems, agricultural crops and other economically useful plants, human impacts, and regional conservation efforts. Human cultural traditions in Andean Life will be an important secondary focus, being integral to the international experience. Studies will focus on three vegetation types along the upper end of the Andean elevational gradient: the high-elevation cushion-plant "puna" community, commonly above 4000 meters; the timberline "paramo" forest, ca. 3000-4000 meters; and the subtropical cloud forest, at 2000-3000 meters.

**Format:** This intensive field course spans three weeks of the Andean spring season, which sees mild temperatures and a fair amount of sun and periodic light showers at lower elevations (2000-3000 meters) but frequently chilly temperatures with sudden snow or hail at very high ones (especially >4000 meters). The class will revolve around four key villages serving as "base camps" for several days of extended hikes into nearby natural communities and surrounding crop lands. The areas, arranged in order of visitation and from lowest to highest elevation, are Coroico (cloud forest), Unduavi (paramo forest), Sorata and Copacabana (puna). At each study area, day hikes will stress observations on community structure, life forms, identification of major plant genera and families, uses of economically important crops and agricultural practices, and human impacts. Representative plants will be brought back to our lodgings for evening study. Suppertime discussions will review each day's observations and events. Communal evening study sessions will focus on reviews of plant identifications and distinctions, and illustration of characteristic plants. Time will also be included for students to record significant field observations and personal reflections in their daily journal.

During the course, students will also participate in faculty-directed terrestrial and aquatic plant research projects on which they will be briefed fully during the Fall quarter. Students will utilize field identification skills, will prepare representative plant specimens as vouchers, will apply standard ecological sampling techniques for vegetation, record soil and/or water chemistry data, preserve plant tissue of populations and species for laboratory molecular genetic analysis, read maps, and use a Global Positioning System to obtain latitude, longitude and elevation. An in-country professional botanist, Stephan Beck, Director of the Herbario Nacional in La Paz, will accompany us during the Unduavi trip, assist with field studies and give guest lectures on special topics. Students from the Instituto de Ecologia will also accompany us, giving OU students an opportunity to interact with Bolivian students and utilize their foreign language skills.

While the learning component of the course and three field exams will be administered in Bolivia during the Fall-Winter Intersession, students will complete the course and receive their final grade during the early weeks of Winter quarter, by turning in their daily journal, completing course evaluations and participating in debriefing sessions.

**Enrollment/Credits:** Up to 10 undergraduate students and 5 graduate students; 3 credit hours, registering for Winter quarter; all field course participants will be pre-registered by the instructors through the Summer Sessions office.

**Eligibility:** Open to all undergrad natural sciences majors meeting the prerequisite, and PBIO/BIOS/MSES grad students; eligibility must be approved early in the Fall quarter by the instructors.

**Prerequisites:** PBIO 111, PBIO 405/693 (*Ecology of the Andes* fall quarter seminar), additional briefing sessions, at least sophomore standing in Fall, and instructor permission; Plant Systematics (PBIO 309/509) or Plant Ecology (PBIO 425/525) strongly recommended.

**Evaluations of Student Progress:**

* Three field examinations (300 points, 100 points each), one on cloud forest, a second on paramo forest, and a third on moist puna, completed during field course
* Participation in daily field lessons and research project, and in evening review of site observations, research data and plants identified (100 points); accomplished during field course
* Maintenance of a daily journal with field observations, plant illustrations and identifying features, and personal experiences (100 points); journal will be handed in during de-briefing session of 2nd week, Winter quarter

**Field Course Itinerary and Content:** Lecture topics, field exams and travel itinerary for the intersession field course, and course follow-up with journal completion, student debriefings and evaluations early in Winter quarter, are as follows.

**Date**, **Location and Lodging**, **Activity and Focus (H3)**

Fall-Winter Intersession 2000

Nov. 21, Fly to La Paz, Overnight on plane (ugh!)

Nov. 22-23, La Paz; lodging (2 nights) at Hotel Viena, City marketplace: fruits, vegetables and medicinals; tour of La Paz; meet National Herbarium personnel

Nov. 24-28, Coroico; lodging (5 nights) at Hostal Kory. Field studies: subtropical cloud forest vegetation and stream ecology; citrus, banana, coffee and coca agriculture

Nov. 29, Corioco, Field exam: Subtropical cloud forest

Nov. 29 to Dec.2, Day visits to Unduavi and Chuspipata areas; lodging (4 nights) at Hotel Viena in La Paz, Field studies: paramo forest and stream ecology

Dec. 3, Unduavi/Chuspipata, Field exam: paramo forest and streams

Dec. 3, La Paz; lodging (1 nights) at Hotel Viena, Preparation for Sorata

Dec. 4-8, Sorata; lodging (5 nights) at Hotel Copacabana; Field studies: moist alpine puna and lake ecology; potato agriculture, llama raising and house building

Dec. 9, Sorata; Field exam: moist alpine puna and lake ecology, Field studies: dry alpine puna and lake ecology; hiking tour of Inca roads and fishing villages; Sailboat trip to Isla del Sol and Inca ruins

Dec. 11-12, La Paz; lodging (2 nights) at Hotel Viena; Research materials deposited with Herbario Nacional personnel; souvenir shopping; preparations for departure

Dec. 13, Fly back to Columbus

**Winter 2001**

Week 1, Environmental & Plant Biology Department; Student evaluations; review of course format, content and highlights

Weeks 2-4, Faculty homes/, Environmental & Plant Biology Department; Student journal turned in (Week 2); informal debriefings, slide shows and discussion of trip highlights; expansion of web page for course

**Texts and Other Resources (H3)**

* Required text--Maas, P. J. M. and L. Y. T. Westra. 1998. Neotropical Plant Families, 2nd ed. Koeltz Scientific Books, Königstein, Germany [available starting late summer quarter in local university bookstores]
* Recommended texts--Berlitz Latin American Spanish Phrasebook and Dictionary; Lonely Planet Guidebook to South America [ditto above]
* Hand lens [available in local university bookstores]
* Other resources--this web site, and other links, covering travel issues, preparation details, images of communities and characteristic plants, information on the region

**Expenses for the Field Course (H3)**

[Tuition, 3 credit hours; register in Winter quarter--$462 in-state, $987 out-of-state]

**Domestic expenses**

* Passport—$80
* Vaccinations (yellow fever, typhoid, Hepatitis A)—$130
* Textbook—$25
* Hand lens—ca. $15
* International Student Identity Card (through Study Abroad office)—$20
* Recommended spending money—$100-150

**"Worst case" travel expenses**

* Airfare roundtrip (may be cheaper with group or charter rates)—$1000
* Meals and lodging (pretty accurate)—$350
* In-country transportation—$75-200 [depends on how Unduavi trip is structured]

Prepared by Harvey Ballard; last revised Oct. 20, 2000