

## Expedition to montane rain forest Queara–Fuertecillo

This expedition took place from February 23 to March 9, 2008, during the rainy season. Its main objective was to make general collections of fertile material from the altitudinal transect from Queara to Sumpulo (Fig. 1), where we also established temporary and permanent plots. Despite the almost constant rain, which made our work difficult, we got good results. We collected about 500 specimens of vascular plants and 140 species of bryophytes and lichens. Among the most interesting collections, we collected new species of the genus *Elaphoglossum* (1 sp), *Piper* (2 sp.) and *Mandevilla*; probably new species of the genus *Elleanthus*, *Satyria*, *Prunus*, *Symplocos*, *Cyathea*, *Persea*, and *Ocotea*; and some additional families to the checklist of Madidi, Callitrichaceae and Potamogetonaceae. We also made numerous collections of orchids that in this season were flowering.



Fig. 1. Location of communities and localities visited during the expedition Quera-Fuertecillo.

## Staff

Alfredo Fuentes led the expedition, accompanied by Javier Quisbert who recently is part of the project Madidi team and Ivan Jimenez fern specialist from the National Herbarium of Bolivia. Ruben Lipa and Rufino Machaca participated as guides from the Mojos community and mule drivers from the communities of Queara and Mojos.



**Photo 1.** View of the altiplano near Titicaca Lake, crops in bloom. Photo A. Fuentes.

## Notes from the expedition

We left the National Herbarium of Bolivia in the morning, later we went through the Titicaca Lake basin, which despite its millennial history of use, still provides food to the Andean villagers. There is an amazing variety of crops despite the extreme conditions. The native andean crops such as oca (*Oxalis tuberosa*), quinoa (*Chenopodium quinoa*), tarwi (*Lupinus mutabilis*), potatoes (*Solanum tuberosum*) and isaño (*Tropaeolum sp.*) that are grown among non-native crops such as barley (*Secale cereale*), oats (*Avena sativa*), broad bean (*Vicia faba*), peas (*Pisum sativum*), onions (*Allium cepa*) and others who were in bloom and gave an heterogeneous aspect to the altiplano (Photo 1).

Later we stopped to collect near Ulla Ulla on the altiplano, which has a different appearance due to the frequent frost, so the conditions are not suitable for agriculture but are well suited for the camelids. Here we collected in aquatic plant communities (Photo 2) dominated by *Elodea*, *Myriophyllum quitense* and *Potamogeton pectinatus*, the second species belongs to the family Potamogetonaceae, which record for our checklist of plants in the Madidi Region.

The next day we went from Pelechuco to Queara while collecting at Paso Sanchez, in the snow. We also here collected aquatic plants in small temporary lakes (Photo 3) where we found a specimen of Callitrichaceae, another new family for the checklist. We did short stops along the way, to make collections in the high Andean grassland dominated by families like Poaceae, Juncaceae, and Asteraceae. While the mule drivers gathered the animals we collected in the vicinity of Queara. The next day we

started the hike towards Chuncani. Shortly after leaving Queara we saw that the road had advanced a few more kilometres (Photo 4), apparently the road is planned to end in the community Mojos. If so this road would go through the national park and one of the most interesting areas of montane forests in Bolivia because of its heterogeneity, diversity, and presence of numerous new and endemic species. These species are restricted to small areas especially mountain ridges. The road constitutes a threat to the forest which play an important role in collecting water and regulating the water flows in the region.



**Photo 2.** Alfredo collecting aquatic plants in a stream of Ulla Ulla. Photo J. Quisbert.



**Photo 3.** Ivan and Alfredo collecting aquatic plants near Paso Sanchez. Photo J. Quisbert.



**Photo 4.** View of Queara Viejo and the newly opened road. Photo A. Fuentes.

During the first day of the trek it began to rain just before noon, so we got wet and remained so for the rest of the day (Photo 6), we only stopped for lunch at Chaquimayu where we were shivering because of the cold. The crossing of the Chullu river was by the means of a slippery trunk because the river had risen significantly (Photo 5). We camped at Tambo Quemado and the next day pressed on to Chuncani. At the locality known as mosquito we observed a large population of *Neurolepis*, a bamboo that was in bloom (Photo 7).

In this sector Ivan collected a small fern tree from the genus *Cyathea*, it is probably a new species (Photo 8). Later we saw some fresh evidences of the spectacled bear (*Tremarctus ornata*), droppings and recently eaten bromeliads (*Puya brittonii*) (Photo 9) and broken palms of *Ceroxylon parvifrons* and *Geonoma weberbaueri* to consume the palmheart and the tender leaves.

We arrived at Chuncani in the afternoon, and in the pouring rain we established the camp and had a tiny dinner. Here we collected in the surrounding for a couple of days

and towards Tocoaque. Chuncani is a very interesting area, it lies on a mountain ridge often covered by mist. We collected many new species and new records of both ferns, bryophytes, and vascular plants. Among the noelties we had a new species of *Piper*, *Elaphoglossum*, *Mandevilla* sp. nov. (Photo 10 M) and other interesting collections that are still under study.



**Photo 5.** Ivan passing over the river Chullu. Photo A. Fuentes.

**Photo 6.** Javier and Ivan walking in the rain. Photo A. Fuentes.

**Photo 7.** Bamboo (*Neurolepis acuminatissima*) in massive flowering. Photo A. Fuentes.

During our stay in Chuncani, there was not many annoying insects during the day but at night when we pressed our collections we suffered the frequent harmless attack of moths that were attracted by our headlights. The smaller moths were bearable, but the larger ones made it almost impossible to work, lighting a candle distracted them from our headlights. Every day it rained in the afternoon and some days it rained hard, so much that the trails turned to small streams.

We moved the camp to Fuertecillo (1900 m), under an incessant rain and parts of the trail were very muddy, fortunately we arrived without any problem. From this camp we visited some of the temporary and permanent plots near Tocoaque (2300 m). This time we did not collect a lot of material except a few Lauraceae species of *Ocotea* and *Persea* in flower. Most of the trees were past flowering, which apparently is between December and January, when the rainy season is at its peak. Consequently most of the fertile collections we did in the plots were of fruiting material, including the copal (*Protium montanum*) a little known species, endemic to the mountainous Yungas forests of Bolivia, whose resin is used as incense (Photo 10C).

In Tocoaque we collected *Satyria* sp. nov with flowers. (Photo 10A) and we persistently sought an interesting kind of orchid from the genus *Elleanthus*, easily to recognize

because of its quadrangular stems, which we had previously collected with fruits and Roberto Vasquez (specialist of orchids from Bolivia) had told us that could be a new species. We finally found it with flowers and a collection was secured (Photo 10B). At Fuertecillo it was much warmer than at Chuncani, and there were all kinds of insects, a variety of mosquitoes, including *Phlebotomus* (the *Leishmania* vector) which are more tenacious and insistent in the late afternoon, also there were bees, wasps and moths, but not as annoying at night as in Chuncani (Photo 11).



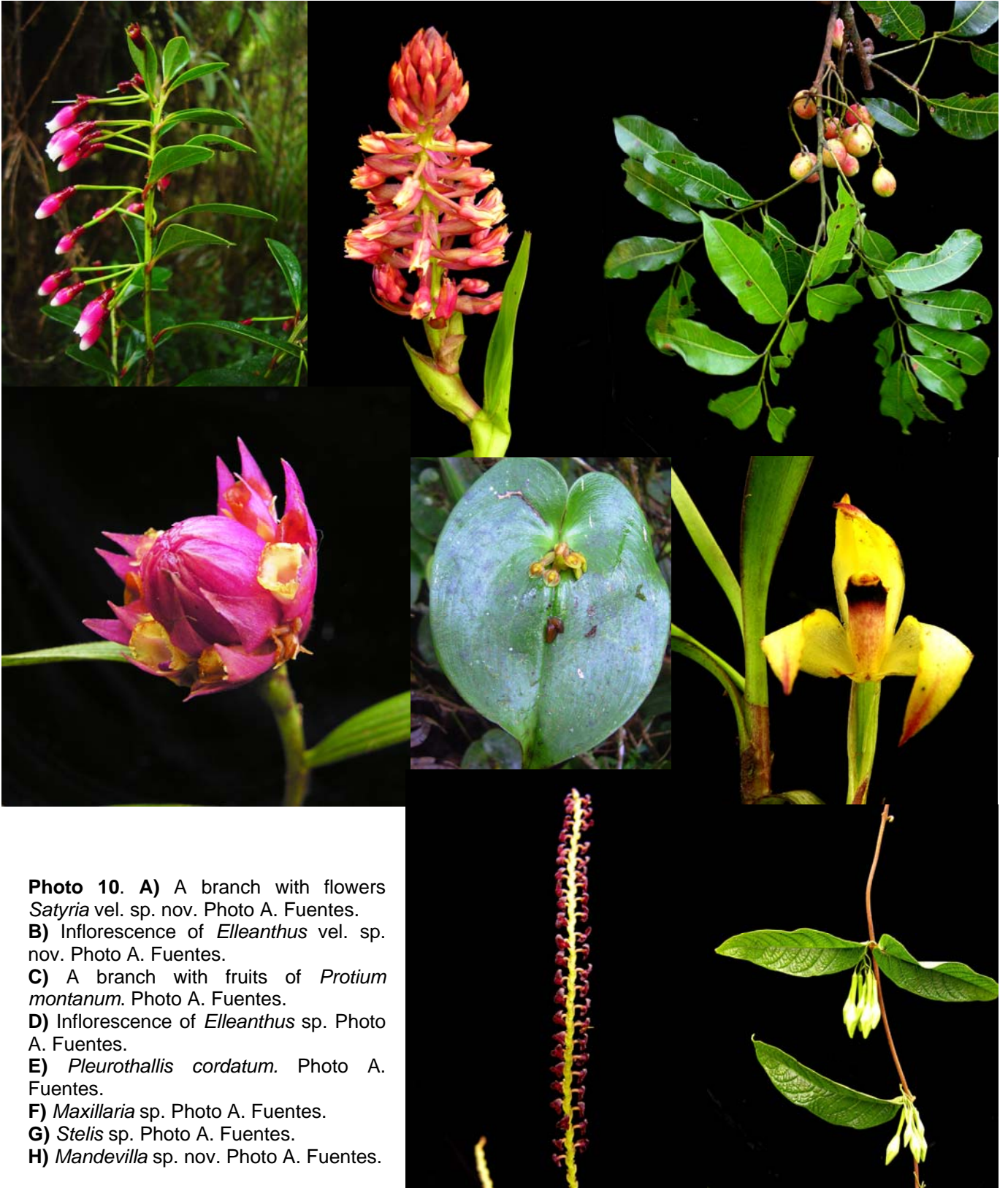
**Photo 8.** *Cyathea* vel. sp. nov. Photo I. Jimenez.

**Photo 9.** Remains of bromeliad (*Puya brittonii*) ate by the Andean bear. Photo A. Fuentes.

One day in the afternoon, we were surprised by a couple of community members from Mojos, who passed through due to inciensal just north of us called Linter. They regularly harvest the resin of *Clusia pachamamae* to sell. They harvest it under difficult conditions in the cold rain, cold, bites from snakes and even lack of water to drink in some cases. We gave them cookies and candy for their hard days ahead and they continued their journey.

In the stretch between Chuncani and Fuertecillo we collected many orchids in bloom with their flowers in alcohol and photos to ease the identification. There were many logs and fallen branches with orchids and other epiphytes, during the rainy season the branches have to carry more weight. The epiphyte load with the absorbed or trapped water exceed the weight the branches can carry and they fall to the ground. Among the orchids we found at least nine species from the genus *Elleanthus*, two of them might be new to science (Photo 10 B and D), an interesting result because normally the genera *Maxillaria*, *Pleurothallis* and *Stelis* are more diverse at this altitude (Photos 10 E, F and G).

From Fuertecillo two mule drivers from Queara picked us up, Don Polycarpio Madriaga and his father Paul Madriaga who is more than 70 years old (Photo 12). Both of them helped us because there were not other people available in the community. Most of the people are working in the gold mining industry (Photo 13). So they and their children helped us both to get in and out.



**Photo 10. A)** A branch with flowers *Satyria* vel. sp. nov. Photo A. Fuentes.  
**B)** Inflorescence of *Elleanthus* vel. sp. nov. Photo A. Fuentes.  
**C)** A branch with fruits of *Protium montanum*. Photo A. Fuentes.  
**D)** Inflorescence of *Elleanthus* sp. Photo A. Fuentes.  
**E)** *Pleurothallis cordatum*. Photo A. Fuentes.  
**F)** *Maxillaria* sp. Photo A. Fuentes.  
**G)** *Stelis* sp. Photo A. Fuentes.  
**H)** *Mandevilla* sp. nov. Photo A. Fuentes.



**Photo 11.** Alfredo and Javier pressing during night in Fuertecillo. Photo A. Fuentes.



**Photo 12.** Pablo and Polycarpio Madriaga, mule drivers from Queara. Photo A. Fuentes.

On the way out we first stopped in Chuncani, to make a phytosociologic inventory, we took pictures of orchids and pressed additional collections that we had made along the trail. The next day we agreed with Polycarpio to spend the night at Tambo Quemado, but they changed the plans and camped further ahead near the Tuquilani river. Ivan, Javier and Alfredo arrived late at night they had spent time collecting and during the night there was a thunderstorm that kept us awake the entire night. The next day was the first and only sunny day we had had during the entire trip, and we arrived at Queara. We did our last collections along the road to Pelechuco and the next day we went to La Paz on the bus.



**Photo 13.** Polycarpio passing over the river Chullu with mules. Photo J. Quisbert.