

Collecting in Amazonian Peru: A Letter from the Field

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There had been sunny skies for two days, rare at this time of year, so I decided to make a special side trip to see if I could solve some puzzles that I encountered while identifying a group of rubiads about a year ago. Rubiad is a kind of nickname commonly used by botanists to refer to plants belonging to the family Rubiaceae, a very large assemblage of species that includes such things as coffee, gardenias, and the quinine-yielding cinchona tree. A good story should have an interest-catching beginning, and fortunately I don't have to invent one, for this story has its own.

The beginning was amidst the pomp and grandeur of Europe in the eighteenth century, what the historians aptly call the Age of Enlightenment. Only I really can't recount for you more than the barest essentials, otherwise I would never get around to telling what happened on this two-day journey. Fortunately someone else has already written about that earlier period in a book titled *Flowers for the King*, and I must say that the book's author has done a much finer job than ever I could. But to get on with the story, the eighteenth century in Europe was a time when royalty and nobility took a great interest in the new fields of science and natural history.

At that time Charles III, King of Spain and Emperor of the Holy Roman Empire, though ruler over more territory than any other sovereign, thought his court was rather provincial. While other princes had sent out expeditions to various parts of the world to bring back curiosities to fill their "natural history cabinets," and in so doing considerably advanced the sciences of biology and geology, Spanish sovereigns had been content to ignore such pursuits. It was apparent to Charles III that his court had in this respect fallen behind the fashions of the day. To correct this oversight he ordered three grand expeditions to be sent to the three viceroyalties into which his lands in the Americas were

then divided. These expeditions were instructed to inventory the natural resources, especially the vegetable and mineral resources of those regions.

The expedition to the Viceroyalty of Peru was entrusted to two very capable botanists, Hipolito Ruiz and José Pavón, who were accompanied by the French botanist and geologist Msr. Dombey, plus a host of assistants, including artists to make color illustrations of the plants, minerals, and animals. Ruiz and Pavón spent several years in Peru and Chile making extensive collections throughout those areas that were accessible to them.

Only in one area of Peru were they able to get down into the rich Amazonian forest, and then they were able to penetrate only into the edge, the region now called *Ceja de la Montaña* (Eyebrow of the Mountains). From that region they brought back and described a great abundance of species of plants new to science.

Among these "novelties" were a great many rubiads, for they had explicit instructions to make a special study of the quinine-yielding cinchona tree and its relatives. Quinine bark was the most important export from this forest region, bringing fabulous prices on the world market and a considerable revenue to the Spanish government. Thus it was that when they returned to Madrid they took with them extensive collections of dried plant specimens from the *Ceja* region.

In the two hundred years since Ruiz and Pavón entered the Amazonian forest, numerous other botanists have traveled through the same area collecting plant specimens for scientific study, some collectors even retracing part of the route of the royal expedition. Despite that, to this day many of the new species described by Ruiz and Pavón have not been encountered again and are known only from the dried specimens they took back to the Royal Botanic Garden in

Madrid. I became aware of this just about a year ago and was quite puzzled about the reason. Are those species now extinct in that area? Are they still there but have just been missed by other botanists? This seemed unlikely because Professor Poeppig, the very meticulous German botanist, had retraced part of the route taken by Ruiz and Pavón, making careful collections when on his long expedition of the 1840s. A third possibility came to mind that some of those Ruiz and Pavón species were really just random mutants of some common species, what the horticulturist calls "sports." This last possibility seemed unlikely also because from other evidence we know that Ruiz and Pavón were very accomplished scientists, keen observers, and unlikely to have been misled into calling a wild mutant plant a new species.

That left the first hypothesis seeming to be the most likely—until I remembered one other thing. The year before, I had made a trip by car from Tingo María to Huanuco and back, looking for some plants belonging to the gloxinia family, and our road had taken us through the area of the *Ceja* where Ruiz and Pavón had spent so much time. I distinctly remember passing through areas of forest, some of which appeared to be still virgin woodland as Ruiz and Pavón described them. Well, there is only one way to solve those puzzles, and that is to go over that road again and make a careful search in the remaining parcels of forest for these "lost" species.

Fortunately I had a few more days before having to go to Aguaytia out on the flatlands of the Amazon Basin. I mentioned my intention to some of the biologists at the local agricultural university and learned that the entomologist was anxious to search for certain types of beetles in that same area. Pooling our resources, we hired a car and driver and, joined by Mr. Schunke, the field botanist who works



Cordillera Azul between Tingo María and Pucallpa, Peru.

for our Amazonian forests inventory project, we set out on Sunday for Huanuco.

Located in a rather dry part of the Upper Valley of the Huallaga River, about 6,500 feet above sea level, Huanuco is the departmental capital (a department is more or less equivalent to a state) and dates back to colonial times. The road between Tingo María and Huanuco, formerly a narrow single lane that was often impassable in the wet season, has recently been widened, and, though unpaved, has an all-weather gravel surface. When Ruiz and Pavón traveled here two centuries ago there was only a trail which they traveled by mule train. Where the going was especially steep and slick they were forced to dismount and travel on foot.

We stayed overnight in Huanuco and enjoyed breakfast in its ideal morning temperature before making the return trip on Monday, over the same road. The 6,500-foot elevation here gives night temperatures that are cool but not chilly, while the days are warm and dry. The highway on leaving Huanuco leads down the Huallaga River for a way, then climbs to the 9,100-foot-high Carpish Pass, dropping on the other side to eventually enter the Middle Valley of the Huallaga River, where it passes through Tingo María, which sits at about 2,000 feet.

At about 9,000 feet we stopped and entered the forest on foot. The trees here are small though mature, the branches covered with heavy growths of mosses, lichens, and numerous larger epiphytes. The undergrowth is a nearly impenetrable tangle of shrubs, vines, and hardy species of bamboo grass (*Chusquea* sp.). We followed paths already cut into the dense undergrowth, but to reach a plant in bloom only a few yards off the path we had to clear every foot of the way with machetes. We were rewarded with an important "find," a blue-flowered shrub with only one cluster of flowers

remaining, all the others having already set fruit and dropped their blue corollas. I was excited; this may be one of the "lost" rubiad species. Ruíz and Pavón collected a great number of plants in this region that were new to science. Most of them are now fairly well known to present-day botanists, but there were a few which have not been encountered again by botanists and which I refer to as "lost."

Later, back in Tingo María I checked my notes and found this is indeed a Ruíz and Pavón species, but it is not one of the "lost" species. Neither is it one of the well known ones. It seems that our blue-flowered plant has been seen only twice in the 200 years since the royal expedition so it will be a valuable addition to Field Museum's collections. Its value, though, is not so much in its rarity but because it may, on examination in the laboratory, provide some answers to some botanical riddles concerning this species and certain of its allies. I shan't attempt to recount at this time the nature of these scientific riddles, for they are rather complicated.

The temperature dropped a bit as low clouds moving in from the northeast blotted out the sun. We returned to the car to put on sweaters and jackets and to drive on through the tunnel built under the crest of the pass.

We continued on down the mountainside for about six miles to where the forest, still a cloud forest, is taller and, we soon learned, much richer in number of different species it contains.

We parked along the roadside and entered the forest on a spur of the mountainside that juts out from the road then drops away precipitously. My associate stopped to join the entomologist in tearing apart some rotting logs in search of wood beetles, so I proceeded along a trail that climbed a short distance then descended again. The trail ended

abruptly where a small tree that had been chopped down had fallen about five yards down a precipitous slope, thus creating an opening with a magnificent view of the canyon and mountains.

As I stood there enjoying the view a blob of red caught my eye to the left. It was an epiphytic shrub in bloom hanging from one of the larger trees. With binoculars I saw that it was an ericad, of which there are a great variety of species (they belong to the *Rhododendron* family). I am collecting them for special study. This one was different from the ericads we collected the previous afternoon at the summit. Those were all terrestrial species—that is, they normally grow in soil—and where you find one you usually can find several others of the same kind nearby. This was one of a group of species that occur only as epiphytes in trees, and usually as widely scattered individuals.

Many epiphytes are notoriously difficult to find and even more difficult to collect because to the collector at ground level anything sitting up on the crown of a tree is usually obscured by intervening lianas, shrubs, and lower trees. And when found, often the only way to collect them requires cutting down the whole tree—usually a great deal of chopping just to get at one small epiphyte. It is little wonder that these epiphytic ericads are rarely collected. To add to the complications, they won't grow in just any forest; they are almost exclusively in mature trees in virgin forest. This was the first time I had ever seen one outside a museum laboratory!

I soon saw that it was on a limb that jutted out over a cliff that dropped away some fifty feet, and the limb wasn't the type one could climb out onto safely. My associate, the field botanist, had in the meantime left the entomologist to his beetles and joined me on the trail. He immediately set to work looking for the right size limb. He

selected one and with a few whacks of the machete had a seven-foot pole with a Y branch at the tip. He hooked the Y against a branch of the flowering ericad, twisted several turns, then pulled. The branch snapped and we soon had one specimen in our hands. But we needed more flowering branches, so he tried for a larger stem. It broke off, but landed over near the fallen tree trunk beyond the end of the trail, some five yards below where I was standing. It was apparent that no more of the ericad could be reached with the Y pole, so I set about finding a way down to retrieve the branch lying below. By working around the other side of a hillock I was able to reach the fallen tree. Stepping out on this and hanging onto any available stump, vine, and branch, I retrieved the ericad.

Then I happened to look down. For some reason I had assumed that the fallen tree was lying on an inclined slope of the mountainside, securely braced against other shrubs and trees. It was being held up by woody branches, but when I looked down there was no hillside below, just branches, air, branches, and more thin air. I could see a tree top 25 yards directly below where I had just stood balanced on one foot, one hand on an unimpressive sized branchlet, stretching as far as I could to reach the ericad. I have all my life had acrophobia, especially where the surface drops away vertically, such as at the window of a skyscraper.

I regained solid ground and rested to let my heart stop pounding and my nerves recuperate. By this time Mr. Schunke was calling me to look at a rubiad he had just found. It seems that while poling for the ericad he had been standing next to a shrubby rubiad he recognized as belonging to the group we were searching for earlier. It was a species belonging to the genus *Psychotria*. Further examination later suggested that it very probably is one of the "lost" rubiads,

The undetermined species of epiphytic ericad that I nearly fell into the abyss to get. Photos by the author.



unseen since the Ruíz and Pavón expedition!

We had just turned to take the collected materials back to the car when Mr. Schunke discovered another shrubby rubiad, which I immediately recognized as another species of *Psychotria* belonging to a different and very distinctive section of the genus, but I couldn't recall any species that has the appearance of this specimen. Even after checking my notes I'm still unable to decide. Is it something previously unknown in this part of South America, or possibly something previously unknown to science? I won't be able to answer these questions until I have a chance to study the specimen in the laboratory at Field Museum and compare it with our extensive herbarium holdings. They include 200-year-old specimens collected by Ruíz and Pavón on this mountainside, which

we obtained in the early 1950s from the Royal Botanical Garden Herbarium in Madrid.

We traveled on, stopping once more near where the Chinchauto enters the Huallaga River to make one more search for ericads and rubiads. No luck here, but it was getting dark so we returned to the car and resumed our journey. At the juncture with the Huallaga River we left the trail of Ruíz and Pavón. They turned upstream and stopped at the village of Cochero, spending quite a long time there collecting in the rich forests that surrounded the village. Neither the village nor the forests exist today; this whole mountainside is now open grassland.

Our road turned left to follow the Huallaga downstream along a canyon whose slopes have mostly been

planted in coffee bushes shaded by low, spreading "shimbillo" trees. About fifteen minutes later the canyon broadened to a small valley that contains the village of La Palma, then closed in again. The highway is perched on a ledge between the river and the forested slopes. A few minutes later the canyon ended and on our right was the little agricultural university, and beyond it the town of Tingo María.

The journey was very successful. One conclusion I have reached as a result of our finds is that the "lost" species are probably all there to be found, but in the dense tangle of those cloud forests of the Ceja it may require luck as well as diligent searching to find all of them again.

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