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The first biological explorations of Serranía de los Yariguíes, Colombia

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Just as most of the world's mountains have been climbed, most of the world's bird species and subspecies were found and described decades or even centuries ago. In some remote parts of the Neotropics, however, exploration and discovery continue. This article recounts the exciting results of recent surveys in the Serranía de los Yariguíes in Colombia. Here, several new taxa were discovered, countless other important findings were made, and Critically Endangered species are now protected.

The topography of western Colombia is dominated by three Andean ranges: the West, Central and East Andes. The long río Magdalena valley splits the Central and East Andes. This part of Colombia and its Andean slopes have been a focus of fieldwork for the Colombian Evaluation of Biodiversity in the Andes Project (part of Fundación ProAves' research programme) since 1999, when partially successful attempts were made to study Serranía de San Lucas[10], an isolated massif, and assess the status of the *saltuarius* subspecies of Red-legged Tinamou *Crypturellus erythropus*[7].

Serranía de los Yariguíes (also known as Serranía de los Cobardes) is a 100-km ridge and western spur of the East Andes, rising from 200 m altitude in the Magdalena Valley to 3,400 m. It is connected to the rest of the East Andes at its highest point by a ridge at 2,400 m. The highest elevation *páramo* and upper montane forest are geographically isolated from other habitats at similar elevation in the East Andes.

This isolation drew the region to our attention as a potential centre of local endemism. Our study of satellite maps revealed Serranía de los Yariguíes to be almost entirely forested on its western slope and ridgeline, making it probably the largest remaining tract of forest in the East Andes. Birds of the high elevations had never previously been studied, with only some small collections of widespread lowland species in the 1950s[1]. Moreover, the Yariguíes had been neglected by biologists and birders for decades due to it being a base for insurgent groups. However, such groups had left the region's major municipal centres prior to the start of our studies, leaving the way clear for some important avifaunal exploration.

The Exploration

Our first studies of the Yariguíes highlands (Fig. 6) took place in January 2003 and January 2004. We established various campsites and transects for 4–5 days each in primary forest at c.300–500 m elevational steps. Steep slopes carpeted with virgin forest meant that helicopter drops (see box, p. 42) and mountaineering techniques were necessary to access elevations above 2,500 m on the western slope and ridgeline[5]. Following our initial explorations, further studies were carried out through Proyecto YARE in 2005–2006, particularly on the eastern slope and at lower elevations on the western slope[9], and through Fundación ProAves' ringing and population monitoring work. Additional work was carried out by JEAC in connection with his undergraduate thesis.

Unusually for biological explorations in Colombia, the study was completed almost entirely using non-lethal techniques, such as mist-netting (Fig. 7), photography, field observation, sound recording and the extraction of blood samples. A small number of mist-net mortalities and a handful of selectively taken specimens of cryptic new taxa were deposited at the Instituto de Ciencias Naturales, Universidad Nacional, in Bogotá. Further information on fieldwork methods is presented in our expedition reports[5,9].

Birds of the Yariguíes mountains

The results of our explorations of Serranía de los Yariguíes surpassed our wildest expectations. Our bird list to date comprises 546 species. We recently published details of 153 range extensions of 100 km or more, including several first or second records of species for Colombia's East Andes or the Magdalena Valley and scores of first departmental records for Santander[4].

The lowland avifauna includes various endemics of the Magdalena Valley and the Nechí lowlands Endemic Bird Area. The premontane and lower montane fauna includes bird species which have also been recorded in the few other remaining forest fragments of this elevation in the East Andes. The most interesting habitats were at highest elevations, which held some unique elements, in addition to birds similar to sites elsewhere in the East Andes.

We found five bird species considered to be Critically Endangered at the time of our study: Blue-billed Curassow *Crax alberti* (presence based on many local reports), Gorgeted Wood Quail *Odontophorus strophium* (now considered Endangered), Chestnut-bellied Hummingbird *Amazilia castaneiventris,* Mountain Grackle *Macroagelaius subalaris* (now Endangered) and Niceforo's Wren *Thryothorus nicefori*. This was one of the greatest concentrations of then Critically Endangered species at a single site in the Neotropics.

Other globally threatened birds found in the region included Helmeted Curassow *Pauxi pauxi* (Endangered), Saffron-headed Parrot *Gypopsitta pyrilia* (previously Vulnerable, now Near Threatened), Rusty-faced Parrot *Hapalopsittaca amazonina* (Vulnerable), Black Inca *Coeligena prunellei* (previously Endangered, now Vulnerable; Fig. 9), White-mantled Barbet *Capito hypoleucus* (Vulnerable; Fig. 8), Turquoise Dacnis *Dacnis hartlaubi* (Vulnerable) and Cerulean Warbler *Dendroica cerulea* (Vulnerable).

Gorgeted Wood Quail, Black Inca and Mountain Grackle were downgraded in conservation status as a direct result of our discovery of the world's most important populations of these species in the Serranía de los Yariguíes. Several Near Threatened species and regional endemics were also found. The situation for Blue-billed Currasow is more bleak, with apparent local extinctions having occurred at all lowland sites we studied. Full details of threatened and restricted-range species are published in the expedition reports[5,9].

Perhaps the most widely reported aspect of our study has been the discovery and description of various new bird and other taxa. Few other studies of a single locality in recent decades have resulted in so many discoveries. In 2006, we described a distinctive new subspecies, *yariguierum*, of the Yellow-breasted Brush Finch *Atlapetes latinuchus*, to which we have given the English name Yariguíes Brush Finch (Fig. 2). This subspecies has also been found elsewhere in the East Andes but has its core range in the Yariguíes[6]. A new subspecies of Matorral Tapaculo *Scytalopus griseicollis gilesi* (Fig. 3) is apparently endemic to the high elevations of the Yariguíes massif and differs from populations in the main East Andes in its darker plumage, longer tail, shorter song and lower-pitched scolding call[3].

Other undescribed subspecies of Rufous Spinetail *Synallaxis unirufa*, Slate-crowned Antpitta *Grallaricula nana*[2] (Fig. 4), Upper Magdalena Tapaculo *Scytalopus rodriguezi*[3] and Lachrimose Mountain Tanager *Anisognathus lacrymosus* (Fig. 5) are in the process of description or peer review. The population of Spillmann's Tapaculo *Scytalopus spillmanni* in the Yariguíes and surrounding region may also relate to an undescribed subspecies[3]. Some of the new 'subspecies' described or being described meet some proposed species concepts and may, in time, be elevated to species rank.

The surprising number of undescribed taxa in the Yariguíes is also reflected in butterflies, the only other taxonomic group subject to detailed study. Several undescribed species and subspecies have been found, including a new species of ringlet, *Idioneurula donegani*, considered endemic to the Yariguíes *páramo*[8].

Conservation and ecotourism in the Yariguíes

Partially as a consequence of the results of our studies, Serranía de los Yariguíes was declared a national natural park by the Colombian government in 2005. Fundación ProAves has established two bird reserves as buffers to the National Park to encourage ecotourism; these serve as excellent bases for birders wishing to explore the region. Several successful tours involving Colombian nationals and foreign birders have already taken place. Visits to the reserves must be arranged through Ecoturs (www.ecoturs.org). Ecotourism can give an important boost to the local economy: all profits

Figure 1. Purple-backed Thornbill Ramphomicron microrhynchum is a high-elevation specialist found in the Yariguíes páramo (Blanca C. Huertas H.)

Figure 2. Yellow-breasted (Yariguíes) Brush Finch *Atlapetes latinuchus yariguierum*. This population differs from other *latinuchus* 'subspecies' in having a black mantle and tail, exhibiting only a thin line of yellow marks in the supraloral region and lacking the wing speculum. This individual was designated as a paratype but released following extraction of a blood sample (Blanca C. Huertas H.)

Figure 3. Matorral Tapaculo *Scytalopus griseicollis gilesi*, a new subspecies endemic to the Yariguíes *páramo* (Blanca C. Huertas H.)

"We found five bird species considered to be Critically Endangered at the time of our study"

Figure 4. Slate-crowned Antpitta *Grallaricula nana* undescribed subspecies. The Yariguíes population is apparently related to disjunct populations in the northern East Andes (Blanca C. Huertas H.)

Figure 5 (above). Lachrimose Mountain Tanager *Anisognathus lacrymosus* undescribed subspecies: the population in the Yariguíes *páramo* is highly distinctive in plumage and endemic to the mountain range (Blanca C. Huertas H.)

Figure 6 (top right). Views from the top of the Yariguíes mountains (Blanca C. Huertas H.)

Figure 7 (right). Mist-netting in the Yariguíes *páramo* (Thomas Donegan)

Figure 8 (bottom right). White-mantled Barbet *Capito hypoleucus* is a threatened endemic of northern Colombia: the subspecies *extinctus*, described in 1986 and only known in life since the late 1990s, is present in the Yariguíes (Joseph Tobias; www.neomorphus.com)

Figure 9 (bottom left). Black Inca *Coeligena prunellei*, one of several globally threatened species easily observed at ProAves' new reserve and now downgraded to Vulnerable following the discovery of a healthy population in the Yariguíes (Nick Athanas/Tropical Birding)

from accommodation and tours go directly to ProAves and help improve reserve infrastructure.

The Yariguíes, particularly around San Vicente de Chucurí, is now a safe region to visit. At 700 m altitude in the northernmost part of the mountain range, San Vicente de Chucurí is a pleasant town and a regional centre for coffee and cocoa cultivation. A historic stone trail, the Camino de Lenguerke, traverses the Yariguíes through primary and old secondary forest above San Vicente. Fundación ProAves' reserve includes a large section of this trail. Gorgeted Wood Quail, Mountain Grackle, Chestnut-bellied Hummingbird, White-mantled Barbet, Yellow-breasted (Yariguíes) Brush Finch, Black Inca and the new Upper Magdalena Tapaculo population can all be observed here. Magdalena Valley lowland species such as Helmeted Curassow, White-mantled Barbet, the endemic 'subspecies' of Speckled Chachalaca *Ortalis guttata columbiana* and Saffron-headed Parrot can be observed at a second ProAves reserve in Cerro de la Paz.

Dry valley specialists such as Niceforo's Wren are relatively common in secondary scrub on the eastern slope (e.g. around the town of Galán) and at other localities in the surrounding Chucurí, Suárez and Chicamocha valleys. The *páramo* habitats, where most of the endemic subspecies are found as well as birds such as Purple-backed *Thornbill Ramphomicron microrhynchum* (Fig. 1), are remote and difficult to access; moreover, they

HELICOPTER ACCESS

The highest elevation *páramo* habitats on the western slope of the Yariguíes mountains are remote and pristine, lying tens of kilometres horizontally and 2,700 m vertically from the nearest settlement. The western slope of the massif is carpeted in forest with sheer slopes below the *páramo* and is inaccessible by foot. The only way to get five people and c.300 kg of equipment to an elevation of c.3,000 m on the western slope of the massif (without causing considerable environmental damage) was by helicopter. This presented various logistical challenges.

From the nearest municipal centre (El Carmen de Chucurí), we completed the final leg of our journey in two helicopter trips. Two trips were necessary because lower air pressure at 3,000 m altitude considerably reduces the capacity of a helicopter to hover whilst losing weight during a drop-off. The first batch of equipment required careful planning and labelling to include survival essentials, such as a tent, food, gasoline, stove, machetes and comprehensive first-aid kit. We identified an isolated, windswept peak with low vegetation suitable for the drop-off. Three expedition participants jettisoned equipment from the helicopter and then jumped down 3–4 m to the peak. The pilot returned 30 minutes later with the remaining team members and equipment. In the interim, we had cut the vegetation sufficiently to allow the helicopter to get closer (c.2 m) to ground level. A soft landing was provided by the *páramo* vegetation, which includes a mixture of dead, decaying and live plants and roots (mostly bromeliads).

In the event, abseiling equipment was not necessary for either drop-off or pick-up, but was helpful in the location of a suitable campsite and in the first ascents of various peaks. We camped below the drop-off point in a sheltered valley to protect us from adverse weather, such as the violent lightning storms and heavy rainfall that occurred daily. As there was no mobile phone reception and a satellite phone was outside the expedition's budget, we had no method of telecommunication whilst at our study site. A comprehensive medical kit and a medically trained team member were therefore essential. We arranged with the helicopter pilot to collect us seven days later (or the first day thereafter that had sufficient visibility) at the drop-off point.

Getting out was no easier than getting in. We cleared all vegetation within a 6 m diameter of the peak to allow the runners of the helicopter to touch down and reduced the height of vegetation within a circle of 30 m diameter to 1 m or less above ground, thereby creating a makeshift helipad. Raising a large Colombian flag helped the pilot to relocate us. As with the insertion, two trips were necessary due to the weight restrictions on the helicopter at this altitude.

Although helicopter access was costly and involved considerable personal risk, the rewards were well worth it. Humans had never previously seen, and may possibly never see again, the spectacular views of unbroken forest of the southern Yariguíes mountains. From a biological perspective, this was also our most interesting study site, as we recorded almost all of the endemics and new subspecies here.

> "Few other studies of a single locality in recent decades have resulted in so many discoveries of new birds"

are deep in the National Park so a visit requires permission from the Colombian National Parks Authority. Unfortunately, various areas on the east slope have been landmined, and more remote regions still suffer from political instability, so discussions with local people are important prior to any remote exploration. The only safe terrestrial access to *páramo* of which we are aware comprises a trek of several hours above La Aurora farm, which is itself a strenuous all-day hike from Galán. Alternative ridgetop habitat harbouring some (albeit not all) *páramo* specialists is at Alto Cantagallos, a day's trek above San Vicente. Each of these sites is c.1,300–1,500 m higher in altitude than the nearest road, so the physical effort involved should not be underestimated.

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