

Notas Breves**SPECIES LIMITS IN THE GENUS *UROSTICTE* (TROCHILIDAE)****Límites de especies en el género *Urosticte* (Trochilidae)****F. Gary Stiles***Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá D.C., Colombia.
fgstiles@unal.edu.co.***Niels K. Krabbe***Zoological Museum, University of Copenhagen, Universitetspark 15, Copenhagen, Denmark.***Thomas S. Schulenberg***Department of Ornithology, Field Museum of Natural History, Chicago, IL, USA.***ABSTRACT**

Species limits in the Andean hummingbird genus *Urosticte* have been in doubt for over a century, with one to three species having been recognized by different authors. The source of disagreement is the description of *U. intermedia* by Taczanowski in 1882 from NE Peru, a form supposedly intermediate between the Pacific-slope *benjamini* and the Amazonian-slope *ruficrissa*. Based on examination of the extant material of *intermedia* and distribution of all forms, we conclude that *intermedia* represents a mutant phenotype in a population of *ruficrissa* and thus has no taxonomic validity; we recommend recognition of *benjamini* and *ruficrissa* as distinct species, and further conclude that there is no basis for inclusion of *benjamini* in the avifauna of Peru.

Key words: distribution, Peru, species limits, Trochilidae, *Urosticte*

RESUMEN

Los límites entre las especies de colibríes andinos del género *Urosticte* han sido discutidos por más de un siglo, tiempo durante el cual diferentes autores han reconocido entre una y tres especies. Este desacuerdo se debía a la descripción de *U. intermedia* por Taczanowski en 1882, una forma supuestamente intermedia entre *benjamini* de la vertiente del Pacífico y *ruficrissa* del lado amazónico, del NE de Perú. Con base en el examen de los ejemplares existentes de *intermedia* e información sobre distribuciones, concluimos que *intermedia* representa un fenotipo mutante en una población de *ruficrissa* y carece de validez taxonómica, por lo tanto recomendamos que *benjamini* y *ruficrissa* se reconozcan como especies distintas; también encontramos que no existen bases para la inclusión de *benjamini* en la avifauna de Perú.

Palabras clave: distribución, límites de especies, Perú, Trochilidae, *Urosticte*

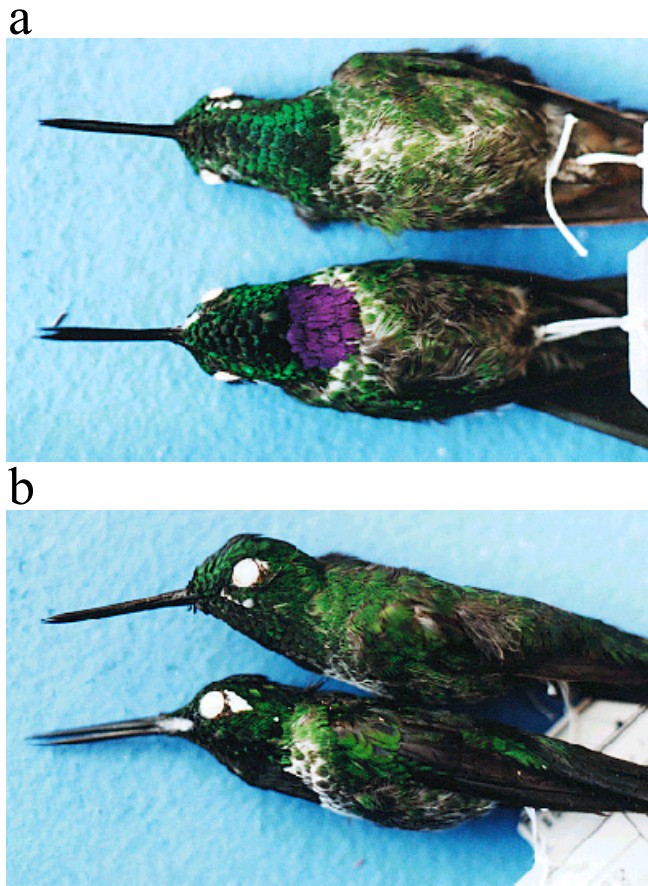


Figure 1. Males of *Urosticte benjamini* and *U. ruficrissa*. **a.** ventral view; **b.** side view. Note the color, shape and location of the purple breast patch, whitish to green crissum, white postocular spot and whitish pectoral band in *benjamini* and the dull, grayish postocular spot and midbreast stripe, buffy crissum and lack of purple of *ruficrissa*. Photos FGS.

Hummingbirds of the genus *Urosticte* (the White-tips) are fairly small (3–4 g) inhabitants of the forested lower slopes and foothills of the northern Andes. They usually are considered uncommon (or at least rather seldom seen), being mainly denizens of the midlevels and subcanopy of heavy forest (Schuchmann 1999, Ridgely & Greenfield 2001, pers. obs.). The most striking feature of the genus is the broadly white-tipped central pair of rectrices of the adult males, unique in the subfamily Trochilinae (or, added to the fact that these birds have forked tails, in the entire family Trochilidae). Although the genus *Urosticte* has been recognized by all authors for 150 years, the number of included species has varied from one to three over the last century.

The first taxon of the genus to be described was *U. benjamini* (as *Trochilus benjamini*) by Bourcier in 1851, from Gualea, on the Pacific slope of the Andes of Ecuador. In 1853 Gould erected the genus *Urosticte* for it, based upon the unique tail pattern. Lawrence in 1864 described *U. ruficrissa* from “Ecuador” (later restricted by Simon (1921) to the

Río Pastaza of eastern Ecuador). (For the original citations, see Schuchmann 1999). The most conspicuous difference between the males of these two taxa is a large, shield-shaped violet-purple patch on the chest of *benjamini*, lacking in *ruficrissa*. Other distinctive characters include the postocular spot (large and white in *benjamini*, small and greyish in *ruficrissa*) and the undertail coverts (bronzy green in *benjamini*, bordered with whitish in the northernmost populations, cinnamon-buff in *ruficrissa*, sometimes with a small green disk centrally). A more subtle character is the fact that the green of the throat is set off from the bronze-green of the breast and sides by a whitish band, somewhat spotted with bronze-green, in *benjamini*; *ruficrissa* has a greyish-white area, more prominently spotted with bronze-green, on the upper midbreast that extends posteriorly but not laterally: it does not set off the green gorget from the sides as does the more whitish area in *benjamini* (see Fig. 1). Also, *ruficrissa* is slightly larger and has a slightly more deeply forked tail that is more bronzy, less green than that of *benjamini*. The females are whitish below spotted with green, with the outer rectrices tipped with buffy. They differ in much the same way as do their males: that of *benjamini* is less heavily spotted and whiter below, greener above with a large white postocular spot, that of *ruficrissa* is grayer below with larger spots of a bronzier green, a small dull postocular spot and a much bronzier tail and a buffy crissum. The two forms occur on opposite sides of the northern Andes: *benjamini* at middle elevations (ca. 700–1600 m) on the Pacific slope from C Colombia regularly to W-C Ecuador, *ruficrissa* at higher elevations (ca. 1600–2300 m) on the Amazonian slope from SE Colombia to NE Perú (Ridgely & Greenfield 2001).

The uncertainty regarding species limits began with the description of *U. intermedia* by Taczanowski (1882), based on three males and one female collected in late June and early July 1880 by the Polish ornithologist Jan Sztolcman (often spelled Stolzmann) at Ray-Urmana and Chirimoto, in the Huallabamba Valley on the eastern slope of the Andes of Depto. Amazonas, NE Perú (Fig. 2). According to Stephens & Traylor (1983), Ray-Urmana (6°28’S, 77°21’W, 2290m) is a mountain above the town of Chirimoto (6°31’S, 77°24’W, 2135m). Evidently the two collecting localities were close together as Sztolcman repeatedly moved between them within a day, to judge from the dates on his specimen labels. In keeping with standard practices of the time, Taczanowski (1882) did not designate a holotype of *intermedia* but stated that the original series of cotypes consisted of three males and a female. He described the adult male of *intermedia* (based on specimen no. P.545, taken at Chirimoto on 3 July 1880, subsequently designated as the type; see below) as: “brilliant green above, feathers of the crown subsquamate; feathers of throat and foreneck squamate, bright green in some lights, and with a dark violet, not very brilliant jugular spot [“gorge et le devant du cou couverts de plumes squamueuses d’un vert éclatant sous certain jour, suivies d’une tache jugulaire

a



b



Figure 2. Extant specimens of *Urosticte intermedia* in the Warsaw Museum.

a. front view. Left, P547 from Ray-Urmana (labelled “cotype”); right bird: P546 from Chirimoto. Note the irregular, purplish-blue patch on the posterior border of the green gorget of the former and the dull postocular spots and lack of a whitish pectoral band in both birds.

b. oblique view. Note the dull greyish midventral area and buffy crissa of both birds, typical of *ruficrissa*. Photos NKK.

d’un violet obscur peu luisant”]; breast and belly green, feathers of the middle broadly bordered grayish white; under tail coverts rufous with green disks; anal region whitish; white postocular spot very small. Wing tips reach the tip of the central rectrices; upper and under wing coverts of the color of the back. Remiges brown with a violaceous lustre, changing to olive in certain lights. Tail strongly forked, feathers of medium width, the middle shortest, the outer three

times as long as the penultimate; tail green with a coppery sheen on the outer half; the two central pairs of rectrices broadly tipped white, the central pair also with a small brown spot on their tips. Underside of tail less brilliant, bronze-olive with a slight coppery sheen towards the tip. Bill black, feet blackish brown, iris black.” Of one of the two male cotypes (P.547) he wrote: “A male, probably less adult, because its rufous under tail coverts lack the green disks.” He described the third male (P.546) as “a young male molting into adult plumage, the green throat almost fully formed, but without a trace of violet; the under tail-coverts paler rufous than in the adults.” Of the female (no number given) he wrote: “Green of upperparts less brilliant than in the male; entire underparts white with green disks, disks on throat and foreneck smaller and less brilliant than the ones on the sides of the belly, which are few in number; under tail coverts white with a slight rufous wash. Tail less deeply forked than in the male, the central rectrices entirely green, the rest green with narrower coppery sheen near their tips than in the male; two outer rectrices broadly tipped white, intermediate rectrices also with some white on tips.” He gave measurements as: “Male: total 118, wingspan 140, wing 58, tail 40, bill 22; female: total 111, wingspan 134, wing 57, tail 40, bill 23”.

Taczanowski considered that these specimens represented a new species “closest to *benjamini*”, probably because of the purple of the throat. However, it is noteworthy that he never made direct comparisons of his material with *ruficrissa* and the wording of his description makes it highly probable that he was unfamiliar with it: his descriptions of birds of both sexes, except for the purple patch on the lower throat of the males, fit this form perfectly. Taczanowski stated that *intermedia* was intermediate between *ruficrissa* and *benjamini* and considered it to be most like the latter, but also noted that *intermedia* differed in the color of the gorget: “its throat spot is also not as large and is of a different shade, less metallic” (“a tache gutturale moins grosse et d’une autre nuance, moins métallique”). He thus appears to have been familiar with *benjamini*, although it is not certain that he had specimens available for direct comparison since he did not mention various other characters that distinguish it from *ruficrissa*.

Hartert (1900), Cory (1918), and Simon (1921) considered *intermedia* to represent a third species of *Urosticte* but Peters (1945), without explanation, treated *intermedia* as a subspecies of *benjamini*. Zimmer (1951) on the other hand concluded from Taczanowski’s diagnosis that although the dimensions of *intermedia* “seemed to be close to *ruficrissa*”, its characters, as reported by Taczanowski, were indeed intermediate between that form and *benjamini* and that all three forms were best considered conspecific, leaving *Urosticte* with only a single species, *benjamini*. This arrangement was followed without comment by Meyer de Schauensee (1966).

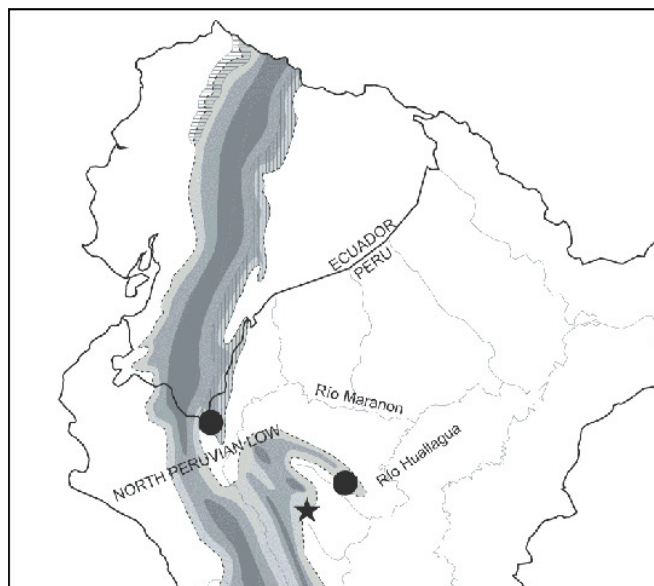


Figure 3. Distribution of *Urosticte bejamini* (horizontal hatching) and *U. ruficrissa* (vertical hatching) in Ecuador and Peru. The Andes are shaded above the 1000 m contour (light gray), 2000 m contour (medium gray) and 3000 m (dark gray) to accentuate the “North Peruvian Low” at the Río Marañón valley. The star represents the Chirimoto/Ray-Urmana area, the type locality of *intermedia*. Peruvian localities for *ruficrissa* are to the northwest (across the North Peruvian Low, and contiguous with populations in Ecuador) and to the northeast (south of the North Peruvian Low). Distribution of taxa in Ecuador after Ridgely and Greenfield (2001).

Sztolcman and Domaniewski (1927) listed one of the males from Chirimoto (P.545) as the type of *intermedia*, the other Chirimoto bird being the “immature” without the violet patch on the throat. The type series of *intermedia* seems never to have been examined by any other ornithologist with the possible exception of Hartert (1900), who described the throat patch as blue (“blau”), which is in fact accurate. Zimmer stated clearly that he had not examined these specimens, and Peters certainly did not in subsuming *intermedia* into *bejamini*. Zimmer did not comment on the fact that one of the specimens of *intermedia* lacked purple on the throat. Rather, his argument for including all three taxa in a single species largely was based on apparent intermediacy in one character or another in specimens of *ruficrissa* or *bejamini* from elsewhere. More recently, Hilty & Brown (1986) and Ridgely & Greenfield (2001) resplit *ruficrissa* and *bejamini*, evidently based on color and distribution, but did not address the question of *intermedia*. Schuchmann (1999) also split them but considered *intermedia* a subspecies of *ruficrissa*, presumably based on Zimmer’s comments.

NK had the opportunity to visit the Warsaw Museum and photograph all type specimens of birds there in September 1993. He was unable to locate the type of *intermedia* (P.545) or the female specimen, which presumably were extant at the time that Sztolcman and Domaniewski (1927) compiled their

type catalog. It seems likely that these specimens were lost during the partial destruction of the museum during World War II. Of the original series, two male syntypes were found: P. 546, taken on 5 July 1880 at Chirimoto and P.547, collected on 29 June 1880 at Ray-Urmana. Photographs of these birds (Fig. 2) clearly show their close resemblance to *ruficrissa*; indeed, the Chirimoto bird appears to be simply a typical male of that form. It does not appear to be immature, and Taczanowski (1882) merely might have assumed this because it lacked the purple on the throat. Presence or absence of green in the crissum in *ruficrissa* apparently occurs throughout its range and represents simply individual variation (Zimmer 1951). The second male (from Ray-Urmana) differs from a typical *ruficrissa* only in its purple patch on the lower throat. However, this patch differs in color (much more bluish), shape (more irregular and narrow) and placement (along the posterior border of the green gorget rather than centered; cf. Fig. 1). It is impossible to be sure that the lost type had a similar patch, but Taczanowski (1882) mentioned no differences between these two specimens in this feature.

Had this cotype and the type of *intermedia* been taken alone in an area of low passes where contact between *ruficrissa* and *bejamini* might be possible (especially towards the Pacific slope, as *ruficrissa* presumably could cross higher passes), they could perhaps be taken as evidence of hybridization or intergradation (in spite of the fact that no other features are obviously intermediate); however, this is not the case. Ray-Urmana and Chirimoto are in the headwaters of the Río Huallabamba, a tributary of the Río Huallaga and clearly in the Amazon drainage; these localities are well removed from the nearest sites known for the Pacific-slope *bejamini* (Fig. 3). In that Ray-Urmana and Chirimoto are well south of the North Peruvian Low, formed by the course of the Río Marañón (another Amazonian tributary), one might imagine that *intermedia* represented a southern isolate of *ruficrissa*. Two male specimens typical of adult male *ruficrissa*, however, were collected recently 15 km by trail northeast of Jirillo, Depto. San Martín by T. Davis. This locality also is south of the North Peruvian Low (and also in the Río Huallaga drainage) and is, as noted by Davis (1986), roughly 100 km NE from the type locality of *intermedia* (Fig. 3). The only other published records of *Urosticte* from Peru are from north of the North Peruvian Low: specimens (Davis 1986) and sight records (Schulenberg et al.1997) of *ruficrissa* from the Cordillera del Cóndor on the Ecuadorian border.

The proximity of the San Martín specimens of *ruficrissa* effectively rules out the possibility that the features of the Ray-Urmana bird (and presumably the type) could be due to gene flow from *bejamini* – especially since the latter occurs regularly S only to NW Ecuador (Ridgely & Greenfield 2001). (However, Clements & Shany (2001) stated that *bejamini* is “uncommon and local in the Andes of Piura at 700-1600 m” but we are unaware of any basis for this

statement and the latter authors, when queried by TSS, were unable to provide any. We conclude that there is no basis for inclusion of *benjamini* in the avifauna of Peru.) The violet area of the chest of these two specimens possibly represents mutations leading to the expression of an ancestral feature in occasional individuals. Accepting this argument requires the additional conclusion that *intermedia* is not a valid taxon, especially since one cotype lacks the violet-blue patch and in all essentials appears to be a normal *ruficrissa*: *intermedia* should be considered simply a synonym of *ruficrissa*. The final conclusion is that “*intermedia*” does not provide a valid reason for lumping *ruficrissa* and *benjamini*: they are morphologically distinct and their distributions, on opposite sides of the Andes, are typical of those of many pairs of related but distinct species. The degree of difference between them is certainly comparable to that found between the eastern and western members of such species pairs (e. g., *Heliangelus amethysticollis* and *exortis*). In effect, the confusion regarding species limits was probably the result of Taczanowski’s (1882) never having seen *ruficrissa* and Zimmer’s (1951) never having seen *intermedia*, compounded by the loss of the original holotype.

We are indebted to Malgorzata Adamzewska, who carefully checked specific birds in the Warsaw Museum (MIZPAS) collection and was of great assistance to NK during his visit, and to Bøje Benzon’s Foundation, which generously funded NK’s visit to Warsaw. The map was drawn by Laura Rico and Sergio Rabiela. We also thank J. Van Remsen, who stimulated us to publish this note.

LITERATURE CITED

- CLEMENTS, J. F. & N. SHANY. 2001. A field guide to the birds of Peru. Lynx Edicions, Barcelona.
- CORY, C. B. 1918. Catalogue of birds of the Americas. Field Museum of Natural History, Zoological Series vol. 13, no. 2, part 1.
- DAVIS, T. J. 1986. Distribution and natural history of some birds from the departments of San Martín and Amazonas, northern Peru. Condor 88: 50-56.
- HARTERT, E. 1900. Trochilidae (Das Tierreich no. 9). R. Friedländer und Sohn, Berlin.
- HILTY, S. L. & W. L. BROWN. 1986. A guide to the birds of Colombia. Princeton University Press, Princeton, NJ.
- MEYER DE SCHAUENSEE, R. 1966. The species of birds of South America with their distributions. Livingston Publishing Co., Narberth, PA.
- PETERS, J. L. 1945. A Checklist of the birds of the world, vol. 5. Museum of Comparative Zoology, Harvard University Press, Cambridge, MA.
- RIDGELY, R. S. & P. J. GREENFIELD. 2001. The birds of Ecuador. Cornell University Press, Ithaca, NY.
- SCHUCHMANN, K. L. 1999. *Urosticte benjamini* y *Urosticte ruficrissa*. Pages 643-644 in Del Hoyo, J., A. Elliot y J. Sargatal (eds.). Handbook of birds of the world, vol. 5. Lynx Edicions, Barcelona.
- SCHULENBERG, T. S., T. A. PARKER, AND W. H. WUST. 1997. Birds of the Cordillera del Cóndor. Pages 63-71 in Schulenberg, T. S. and K. Awbrey (eds). The Cordillera del Cóndor of Ecuador and Peru: a biological assessment. RAP Working Papers 7. Conservation International: Washington DC.
- SIMON, E. 1921. Histoire naturelle des Trochilidae (Synopsis et Catalogue). L. Mulo, Paris.
- STEPHENS, L. & TRAYLOR, M. A., Jr. 1983. Ornithological gazetteer of Peru. Museum of Comparative Zoology, Harvard University: Cambridge, Massachusetts.
- SZTOLCMAN, J. & J. DOMANIEWSKI. 1927. Les types d’oiseaux au Musée Polonais d’Histoire Naturelle. Annales Zoologici Musei Polonici Historiae Naturalis 6 (2): 1-100.
- TACZANOWSKI, L. 1882. Liste des Oiseaux recueillis par M. Stolzmann au Pérou nord-oriental. Proceedings of the Zoological Society of London 1882: 2-49.
- ZIMMER, J. T. 1951. Studies of Peruvian birds, no. 60: the genera *Heliodoxa*, *Phlogophilus*, *Urosticte*, *Polyplancta*, *Adelomyia*, *Coeligena*, *Ensifera*, *Oreotrochilus* and *Topaza*. American Museum Novitates 1513:1-45.

RECIBIDO: 10.X.2005

ACEPTADO: 25.I.2006