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UNDESCRIBED OR LITTLE-KNOWN BIRDS FROM PANAMA

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After my return from western Panama in the spring of 1924, Mr. Rex R. Benson was left in the field to carry on a carefully planned series of expeditions aiming to cover all the remaining unknown or poorly known sections of the country west of the Isthmus. During the rainy season of that year Mr. Benson collected in the vicinity of Santiago, working southward to the coastal forest at the head of Montijo Gulf. These collections confirmed my impression that the heavy-forest species recorded by Arcé from "Santiago," a region where heavy forest never existed, did not occur there. In the late fall of 1924 and during the winter of 1925 Mr. Benson succeeded in reaching the continental divide in the mountains back of Santa Fé, securing over 1000 specimens from the cloud forest and the strip of heavy tropical forest at the base of the mountains. He more than doubled the number of interesting species obtained by Arcé sixty years ago. In addition to the forms described below, he added *Antrostomus rufus* to the known fauna of Veraguas, and obtained several tropical species like *Phænicothraupis fuscicauda*, previously unknown in western Panama, or unknown on the Pacific slope of the continent.

The summer of 1925 was spent in the interior of the Cape Mala peninsula, a mountainous region for the most part covered with heavy forest. Only a very faint tinge of the Subtropical Zone was found to exist. For the most part the avifauna here proved to be exactly the same as that of the coastal forests farther west. His most interesting discovery was a Ground-Dove connecting *Leptotila battyi*, a supposedly distinct species on Coiba Island, with the rare *Leptotila plumbeiceps* of eastern Central America.

The early fall was spent in the arid plains around Agua Dulce and in the nearby coastal swamps. Several water birds collected were previously unrecorded from Panama. Interesting discoveries of greater faunal and geographic interest were *Melopeleia asiatica*, the first definite record for the genus between northwestern Costa Rica and Ecuador, and *Falco fusco-cærulescens femoralis*, the first record for this species between Mexico and northern South America. A new race of *Dendroplex picirostris*

was found in the mangroves and a specimen of the very rare Goatsucker, *Stenopsis albicauda*, was collected.

The winter and early spring of 1926 were spent in an excessively difficult trip to the mountains back of Chitrá, a region much farther east than Santa Fé. All supplies and equipment had to be carried in on the backs of porters, the country being impassable for animals. The wind blew a gale, and it poured rain almost the entire time. His men deserted one by one, and Mr. Benson spent the last two weeks with one Panamanian boy, who was too frightened to find his way back to civilization alone. In spite of these handicaps Mr. Benson again doubled the number of interesting birds secured by Arcé. In addition to the long list of species and forms described below, he obtained *Oreopeleia costaricensis*, *Pharomachrus*, *Scytalopus chiriquensis* and *Pseliophorus luteoviridis*, discovered by me in the Cerro Flores country farther west, *Zeledonia*, *Diglossa* and all the Subtropical Zone genera and species ever recorded from western Panama east of the Volcan de Chiriqui, except *Oxyruncus* and *Cinclus*.

Mr. Benson was so exhausted after this trip that he was unable to take the field again for some time. During all this time he had been greatly aided by the aviators at France Field. Lieut. Dale V. Gaffney, a personal friend, had often brought him supplies and ammunition by airplane, with, of course, the kind co-operation of his chief, Lieut. Colonel Fisher, and the Museum is most appreciative of such invaluable assistance. In the summer of 1926 Benson and Gaffney organized a joint expedition to the Caribbean lowlands. Crossing the continent back of Santa Fé, they descended the mountains with twelve packers and collected at two camps on the Rio Calovevora, reaching an altitude of 800 ft. In addition to several novelties described below, they added *Cre-ciscus cinereiceps*, *Micromonacha lanceolata* and *Sporophila corvina* to Panama, and secured such birds as *Chloronerpes simplex*, *Dechonychura*, *Perissotriccus*, and other species notable either for great rarity, range extension, or both.

In all, the Veraguas collection now amounts to over 3100 specimens, and a total of 39 species and subspecies are described as new. Other forms, apparently new, await possible confirmation by the receipt of further material. The Rio Calevevora collection was acquired largely through the generosity of Mr. Sanford Barnes. The balance of these collections were acquired by me, and donated to the American Museum.

***Odontophorus melanotis coloratus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *Odontophorus melanotis* Salvin of northeastern Costa Rica and eastern Nicaragua, but pileum much brighter rufous, the feathers lacking dusky tips; upperparts, wings, tail, flanks and under tail-coverts much darker brown, more sepia, less olive in ground color; underparts a richer and brighter chestnut, less brown; chin and throat of females devoid of any blackish or dusky wash.

TYPE.—No. 257,127, Amer. Mus. Nat. Hist.; ♀ ad.; Guaval, Rio Calovevora (alt. 1500 ft.), Caribbean rain forest of western Panama; Sept. 4, 1926; R. R. Benson and Lieut. Dale V. Gaffney.

SPECIMENS EXAMINED

Odontophorus melanotis melanotis.—NICARAGUA: 7 ♂, 7 ♀, from throughout the Caribbean slope.

Odontophorus melanotis coloratus.—Western PANAMA: Caribbean rain forest, 1 ♂, 1 ♀; Santa Fé, Veraguas, 1 ♀.

The three specimens listed above from western Panama merely confirm the stability of points of difference long since recorded by Salvin and more recently by Carriker. The typical form is a rather common bird for a partridge in the rain forest at lower altitudes. Many years ago Arcé sent a male from Veraguas to Salvin, though it could not have been taken at Santiago, where there is no heavy forest. The species has never been recorded since from Panama. Benson has recently obtained the three specimens listed above. The brightness of their crowns and their generally richer, deeper coloration agrees with Salvin's comments on Arcé's bird, and Carriker's description of a female from southeastern Costa Rica, which undoubtedly belongs to the form here described as new. Its characters are so marked that a specimen can be recognized immediately without comparison. The Santa Fé bird is, however; slightly darker above and a distinctly deeper, richer chestnut below even than the two specimens from the Caribbean slope. A series would probably show it to be separable as a third subspecies isolated in the tongue of rain forest which stretches westward along the base of the mountains on the Pacific side of the Continental divide.

Sex differences in this species do not seem to be definitely stated in text-books. In our females from Nicaragua, the throat is duskier, less black and is not so sharply demarcated from the chestnut of the breast. In females of *salvini* all traces of dusky are lost, and the throat is a slightly deeper chestnut than the breast. There are no differences in the freckling on the primaries and secondaries in my material.

***Leptotila plumbeiceps malæ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Exactly intermediate between *Leptotila p. plumbeiceps* (Sclater and Salvin) of eastern Central America and Colombia and *Leptotila battyi* Rothschild of Coiba Island, West Panama; upperparts much browner, less olive than typical *plumbeiceps*, with the purple gloss more pronounced over a greater area; throat and breast grayer, less vinaceous; flanks grayish brown rather than buffy olive-brown; differing from *battyi* in being browner, less chestnut above, the purple gloss less extensive; throat and breast more vinaceous, less gray; flanks grayer and paler, less brown.

TYPE.—No. 257,128, Amer. Mus. Nat. Hist.; ad. ♀; Cerro Montosa (2500 ft.), Cape Mala, western Panama; Aug. 2, 1925; Rex R. Benson.

SPECIMENS EXAMINED

Leptotila p. plumbeiceps.—GUATEMALA; Vera Paz, 1? NICARAGUA: Caribbean slope, 2♂, 1♀. COLOMBIA: various localities, 3♂, 3♀.

Leptotila plumbeiceps malæ.—WESTERN PANAMA: Cape Mala, 1♀.

Leptotila plumbeiceps battyi.—COIBA ISLAND, 1♂, 2♀.

The bird here described is of interest chiefly in connecting two Doves which have been hitherto properly regarded as very distinct species, and it is on this ground that I feel justified in basing the new form on one specimen only. Typical *Leptotila plumbeiceps* in Central America at least is a rare species of the darkest heaviest forest, and is unrecorded between Costa Rica and Colombia. Only in Costa Rica has it been found on the Pacific side of the continent. It is of great interest, therefore, to find a form of it on the Pacific side of Panama. The Cerro Montosa is in the very center of the Cape Mala Peninsula, nearly one hundred miles farther east than Coiba Island. The country is covered with heavy forest, but this territory is completely isolated from other forested areas in western Panama by the sea on three sides and savannahs and arid scrub-covered plains to the north.

Specimens are still lacking to confirm the probability that darker colored specimens of *Leptotila plumbeiceps* from southeast Mexico and Guatemala represent a typical race, and lighter birds from farther south a paler undescribed subspecies. Normally the upperparts are olive-brown, but darker colored specimens incline to bistre. The upperparts of *malæ* vary from Mars brown on the interscapulum and primary coverts to Prout's brown on the rump. The normal color of *Leptotila battyi* judging from our specimens and descriptions is uniform chestnut-brown. One specimen is not quite so bright, varying to auburn and cinnamon-brown on the rump, but the wing is distinctly brighter and more chestnut. It is obvious that *battyi* can no longer be maintained as specifically distinct.

THE GENUS *Premnoplex* IN CENTRAL AMERICA

As at present understood, *Premnoplex brunnescens* (Sclater) of Colombia and Ecuador is represented in Costa Rica and western Panama by the subspecies *brunneicauda* (Lawrence). The genus has never been recorded from eastern Panama, but a series in this collection from Mt. Tacarcuna represents a very distinct new form. A good series is now available from the mountains of Veraguas, and shows, as might be expected, that the bird there is easily separable from typical *brunneicauda*.

***Premnoplex brunnescens albescens*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *brunnescens* (Sclater) of Colombia and Ecuador, but paler, less rufous, more olivaceous above, the tail paler; much the palest race beneath, the ground color of the breast and abdomen less brown, more olivaceous; the throat and spots below pale ochraceous instead of deep buff or light buff, some of the spots on the abdomen almost whitish, practically lacking dark borders; tail longer than in any other race.

TYPE.—No. 135,863, Amer. Mus. Nat. Hist.; ♂ ad.; east slope of Mt. Tacarcuna, 4600 ft., eastern Panama; April 13, 1915; Anthony and Ball.

***Premnoplex brunnescens distinctus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Upperparts about intermediate between *brunnescens* of Colombia and *brunneicauda* of Costa Rica, the tail paler, as in the latter; buffy shaft streaks to the feathers on the forehead more conspicuous and better developed than in other races, often extending on to the crown; much darker below and richer buff on the throat than in *brunneicauda*; much nearer in these respects to *brunnescens*, but more olivaceous, less brown; the dark borders to the light spots less conspicuous than in *brunnescens*, thus resembling *brunneicauda* in this respect; size as in *brunneicauda*, larger than typical *brunnescens*.

TYPE.—No. 257,134, Amer. Mus. Nat. Hist.; breeding ♂; Chitrá, 4000 ft., Pacific slope of Veraguas, western Panama; March 11, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Premnoplex brunnescens brunnescens.—COLOMBIA and ECUADOR, 33 ♂, 14 ♀, 8?

Premnoplex brunnescens albescens.—EASTERN PANAMA, 2 ♂, 3 ♀.

Premnoplex brunnescens distinctus.—WESTERN PANAMA: Veraguas, Santa Fé, 3 ♂; Chitrá, 6 ♂, 8 ♀.

Premnoplex brunnescens brunneicauda.—Mts. of COSTA RICA, 3 ♂, 4 ♀.

From the diagnoses given above, it may be inferred that the eastern Panama race, *albescens*, is sharply distinct from all its congeners in its paler underparts and longer tail. Passing northward to western Panama the race *distinctus* is nearer to typical *brunnescens* than to *brunneicauda*, its nearest geographical ally. While combining the various characters separating these two races, in color it is distinctly nearer *brunnescens* on the whole, though in size it is nearer *brunneicauda*. The synopsis below may assist in understanding the variations involved.

P. b. brunnescens.—Upperparts relatively darker and more rufous; tail darker; throat deep buff; underparts relatively darker and browner; shaft streaks on forehead relatively indistinct; wing, 59–64.5; tail, 54–61.

P. b. brunneicauda.—Upperparts relatively paler, less rufous, more olivaceous; tail lighter; throat light buff; underparts paler and more olivaceous; shaft streaks on forehead relatively indistinct; wing, 59.5–70; tail, 60–65.

P. b. distinctus.—Upperparts intermediate; tail lighter; throat deep buff; underparts intermediate, but much nearer *brunnescens*; shaft streaks on forehead relatively distinct; wing, 59–66; tail, 59.5–62.

P. b. albescens.—Upperparts much nearer *brunneicauda*; tail lighter; throat pale ochraceous; underparts paler, as in *brunneicauda*; spotting below paler and less distinctly bordered with darker than any other race; shaft streaks on forehead relatively indistinct; wing, 63.5–66; tail, 67–67.5.

***Dendroplex picirostris extimus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *Dendroplex picirostris* Lafresnaye of northern Colombia and Venezuela, but browner, less rufous above; much browner and duller below, no tinge of rufous in the plumage, abdomen dull Prout's brown rather than fox brown; even browner and less rufescent below than *longirostris* Richmond of Margarita Island, which is more chestnut above than the typical subspecies; pectoral spots slightly smaller than in both other races; size as in typical *picirostris*.

TYPE.—No. 257,131, Amer. Mus. Nat. Hist.; ♂ ad.; Agua Dulce, Prov. Coclé, western Panama; Sept. 2, 1925; Rex R. Benson.

SPECIMENS EXAMINED

Dendroplex picirostris picirostris.—41 specimens from the entire range, including a good series of topotypes.

Dendroplex picirostris longirostris.—MARGARITA ISLAND, 1 ♀.

Dendroplex picirostris extimus.—PANAMA: Darien, Cape Garachiné, 1 ♂; Juan Diaz, Canal Zone, 1 ♂; Coclé, Agua Dulce, 3 ♂, 2 ♀.

This genus was added to Central America by Hallinan (Auk, 1924, p. 319), but this account does not mention that the specimen observed was collected, as was the case. In all three Panama localities the bird has been on or near the coast, in scrub country on the edge of mangrove swamps, where it feeds regularly. The new race is so distinct that no further comment is required.

***Xiphocolaptes emigrans panamensis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Xiphocolaptes emigrans costaricensis* Ridgway of the highlands of Costa Rica, but darker and more rufescent in coloration, both above and below, especially noticeable on the chest, belly and under tail-coverts, and the fore part of the wings; primaries tipped with sooty black instead of grayish brown.

TYPE.—No. 257,129, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (3600 ft.), Veraguas (Pacific slope), western Panama; Jan. 23, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Xiphocolaptes emigrans costaricensis.—COSTA RICA: Aquinares 1 ♂; Bonilla, 2 ♂, 1 ♀

Xiphocolaptes emigrans panamensis.—PANAMA: Chitrá, Veraguas, 1 ♂, 4 ♀.

Mr. Benson is to be congratulated on adding this fine genus of Woodhewers to Panama. In Costa Rica it is one of the very rare birds, and I know of only six specimens, besides the four listed above, previously unrecorded. Two of these are apparently immature, with browner pileums, the underparts broader with looser streaking and irregularly tinged with rufous. The new form is easily distinguished by its darker coloration, and is smaller, with a shorter tail than my *costaricensis*, but the size variation in this race is not known.

***Xiphorhynchus guttatus marginatus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Most closely related to *Xiphorhynchus guttatus costaricensis* Ridgway of Costa Rica; identical in general coloration of upperparts, but wings averaging darker chestnut, the tips of the primaries always more extensively tipped with darker sooty brown; radically different underneath, the chin and throat brighter and deeper buff, the balance of the underparts a deeper shade; the chest more spotted, less striped, the spots heavily margined with black laterally, giving a more squamate effect; in this last character differing from *costaricensis* in the same respect as *X. g. rosenbergi* Bangs does from *X. g. nanus* Lawrence, but to a greater degree.

TYPE.—No. 187,328, Amer. Mus. Nat. Hist.; ♂ ad.; Santa Fé (1600 ft.), Veraguas (Pacific Slope), western Panama; March 16, 1925; Rex R. Benson.

SPECIMENS EXAMINED

Xiphorhynchus guttatus nanus.—CANAL ZONE, 7 ♂, 2 ♀, 1? including the type. Eastern PANAMA, 5 ♂, 4 ♀. Northern COLOMBIA, 5 ♂, 2 ♀.

Xiphorhynchus guttatus costaricensis.—NICARAGUA, 2 ♂, 1 ♀. COSTA RICA: numerous localities, 11 ♂, 10 ♀.

Xiphorhynchus guttatus marginatus.—VERAGUAS: San Lorenzo River, 2 ♂, 1 ♀; Cape Mala Peninsula, 1 ♂, 5 ♀; Santa Fé, 6 ♂, 6 ♀, including the type; Chitrá, 1 ♂, 2 ♀.

The excellent series before me from so many localities emphasizes the wide individual variation in this species both in size and color. The upperparts are more or less tinged with rufous. The streaking on back and chest varies in extent. The coloration of the underparts can be slightly more olivaceous, more clay colored or even more tinged with raw umber, all found for instance, in the Canal Zone series. The race *costaricensis* appeared to be a very poor one at first sight, as browner specimens naturally appeared darker than more clay-colored variations of *nanus* from the Canal Zone. But with further study, browner specimens of *costaricensis* were a darker brown than the browner variations of

nanus, and the same way relatively with the other color variations. In fact there is only one specimen of *nanus* from eastern Panama which is as dark as the large series of *costaricensis*, which is a recognizable darker race. The Veraguas subspecies *marginatus* is far better characterized than *costaricensis*, however, and in no way connects it with *nanus*, although occupying an intermediate territory geographically. It occupies the lowland forests of the province on the Pacific slope, which are more or less isolated by savannahs and large areas of scrub forest from the habitats of the two adjacent races. It will be interesting to see to what race specimens from the Caribbean slope of Veraguas belong.

***Campylorhamphus borealis olivaceus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Campylorhamphus b. borealis* Carriker of Costa Rica, but much darker above and below; the pileum black, the back deep umber-brown, shaft streaks on scapulars and primary coverts light rufous instead of buff, the tips of the primaries extensively sooty; underparts deep brownish olive instead of raw umber; shaft streaks on underparts broader.

TYPE.—No. 257,132, Amer. Mus. Nat. Hist.; ♀ ad.; Chitrá (3600 ft.), Veraguas (Pacific slope), western Panama; Jan. 3, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Campylorhamphus p. pusillus.—10 ♂, 3 ♀, 1? from various localities in COLOMBIA and ECUADOR.

Campylorhamphus b. borealis.—COSTA RICA.—7 ♂, 1 ♀.

Campylorhamphus b. olivaceus.—VERAGUAS: Chitrá, 1 ♀; Rio Calovevora, Caribbean slope, 1 ♀.

The form here proposed is so different from both *Campylorhamphus pusillus* and *C. borealis*, that problems of specific rather than racial distinction are raised. The obvious specific character of *pūsillus* as compared with *trochilirostris* is its brownish and whitish rather than flesh-colored bill. The other color differences are racial characters in *pūsillus*. Mr. Ridgway treated *borealis* as specifically distinct from *pūsillus*, in that its bill was darker above, its general coloration was darker and more olivaceous, it was less streaked below, and not only widely separated geographically from *pūsillus*, but part of the intervening territory (eastern Panama) was occupied by another species, *trochilirostris venezuelensis*. In general body coloration the degree of difference between the three is about the same. The bird here described complicates the question still further. Far from in any way serving to connect *pūsillus* and *borealis*, it varies still farther away from *pūsillus*, although geographically intermediate. Under these circumstances I prefer to regard *borealis* as specifically distinct from *pūsillus*, and on this basis *olivaceus* becomes a well-marked subspecies of the former.

The specimen from the Rio Calovevora is even darker than the type, with narrower and more restricted shaft streaks both above and below. It is apparently another subspecies, but I prefer to await further material before describing it.

***Dendrocolaptes picumnus veraguensis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Resembling *Dendrocolaptes picumnus costaricensis* Ridgway of Costa Rica in the relatively extensively barred lower breast and abdomen, but throat and chest more spotted, less streaked, the white shaft streaks to the feathers of the lower chest lacking; coloration both above and below strikingly tawnier, less grayish olive-brown; differing from the subspecies *seilerni* Hartert and Goodson of Santa Marta and northern Venezuela in exactly the same respects, but to an even greater degree.

TYPE.—No. 257,130, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (4000 ft), Veraguas, west Panama; March 12, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Dendrocolaptes picumnus seilerni.—VENEZUELA: Carabobo, 1 ♂, 1 ♀. COLOMBIA: Santa Marta Region, 4 ♂, 5 ♀, 1 ?.

Dendrocolaptes picumnus costaricensis.—COSTA RICA: La Hondura, 1 ♂, 1 ♀.

Dendrocolaptes picumnus veraguensis.—WESTERN PANAMA: Chitrá, Veraguas, 3 ♂, 1 ♀.

Very few specimens of this species have been taken in Central America, where it is a very rare bird of the Subtropical Zone, and the discovery of a well-marked new race in Veraguas is of some interest. One of our specimens was collected by Arcé many years ago and is brown and discolored with age.

***Pipromorpha oleaginea lutescens*, new subspecies**

SUBSPECIFIC CHARACTERS.—Connecting *Pipromorpha assimilis* with *P. oleaginea*; similar to *Pipromorpha assimilis dyscola* (Bangs) of Chiriqui and western Costa Rica, but olive-green of upperparts brighter and yellower, the upper tail-coverts olive-ochraceous in distinct contrast with the olive-green of rump; edgings of remiges and rectrices broader, golden olive instead of olive-green; radically different below; chin grayish olive passing to yellowish olive on breast, and bright ochre-yellow on balance of underparts; similar also to *Pipromorpha oleaginea parca* (Bangs) of the Canal Zone, but less yellowish olive-green above, the upper tail-coverts less conspicuously ochraceous, the wing-coverts without buff tips; the yellow in the plumage devoid of any buff tint, and underparts a much brighter and clearer shade.

TYPE.—No. 187,459, Amer. Mus. Nat. Hist.; ♂ ad.; Santa Fé (2000 ft.), Veraguas (Pacific slope), western Panama; April 13, 1925; Rex R. Benson.

SPECIMENS EXAMINED

Pipromorpha oleaginea parca.—Large series (45) from eastern PANAMA and COLOMBIA.

Pipromorpha oleaginea lutescens.—PANAMA: Veraguas, Santa Fé, 10♂, 3♀; Chitrá, 2♂; interior of Cape Mala Peninsula, 2♂; 15 miles southeast of Santiago, 7♂, 3♀.

Pipromorpha oleaginea dyscola.—PANAMA: Chiriqui, Boqueron, 4♂, 1♀, 1? S. W. COSTA RICA, 7♂, 2♀.

This interesting discovery bridges the gap separating *Pipromorpha assimilis* and *P. oleaginea* and makes it necessary to regard *assimilis* and *dyscola* Bangs as races of *oleaginea*, the older name. The localities cited above extend east and west nearly 100 miles. Throughout the wooded portions of Veraguas *Pipromorpha* is a common flycatcher. Two specimens before me are not listed above. One is from the Cerro Flores in extreme eastern Chiriqui and the other is from the San Lorenzo River in extreme western Veraguas. These two specimens are exactly intermediate between topotypes of *dyscola* from western Chiriqui and topotypes of *lutescens* of Veraguas. In fact there is almost no limit to the intermediate races which could be carved out of this remarkably variable species. Birds from western Costa Rica are not typical *dyscola*, nor are specimens from eastern Costa Rica typical *assimilis*. In the Veraguas race *lutescens* the birds from Santa Fé and Chitrá in the interior at the base of the mountains are appreciably brighter than a series from the coastal forests.

***Empidonax flavescens floresæ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *Empidonax flavescens* Lawrence of Costa Rica, but upperparts darker and browner, the pileum and upper tail-coverts even browner, in distinct contrast to the back and rump; underparts more deeply and brightly colored, the yellow on throat spot and belly strontian yellow to lemon chrome; chest and sides of breast and throat deep olive-ochre, forming a broad breast band, enclosing the lighter throat spot and contrasted with the belly.

TYPE.—No. 182,830, Amer. Mus. Nat. Hist.; ♂ ad.; Cerro Flores (4000 ft.), extreme eastern Chiriqui, western Panama; March 8, 1924; Griscom, Boulton and others.

***Empidonax flavescens chitræ*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Empidonax flavescens floresæ* nobis described above, but not so brown above, the pileum and upper tail-coverts not so contrasted; in this respect intermediate between *flavescens* and *floresæ*, but distinctly darker than *flavescens*; underparts a duller, more waxy yellow than in *floresæ*, the throat spot darker and more inconspicuous, the chest band varying to light orange-citrine on the sides, blending more gradually into the yellow of the belly.

TYPE.—No. 257,135, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (3600 ft.), Veraguas, Pacific slope of western Panama; March 3, 1926; Rex R. Benson.

SPECIMENS EXAMINED

• *Empidonax flavescens flavescens*.—COSTA RICA: 12♂, 8♀, 1? PANAMA: Boquete, Chiriqui, 8♂.

Empidonax flavescens floresæ.—PANAMA: Cerro Flores, Chiriqui, 7♂, 3♀.

Empidonax flavescens chitræ.—PANAMA: Chitrá, Veraguas, 5♂, 7♀. A male from Santa Fé, Veraguas, is intermediate between *floresæ* and *chitræ*.

The large series of this species listed above from every section of its known range shows that it is readily distinguishable into three races. Veraguas specimens are separable at a glance from Costa Rican material by their brighter, deeper coloration and more conspicuous breast bands. The differences between the two eastern races are relatively slighter, but they are obvious in series, and *floresæ*, the geographical intermediate, is not intermediate in color characters. This species is one of the few really common birds in the lower levels of the Subtropical Zone. On the Cerro Flores it disappeared at about 5500 feet, just at the point where *Scytalopus* and *Myadestes* became common.

***Mitrephanes aurantiiventris vividus*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *Mitrephanes aurantiiventris* (Lawrence) of Costa Rica, but general coloration brighter throughout; upperparts slightly greener, less olive, the pileum not darker, but the crest feathers blacker, thus producing a more contrasted effect; chin, throat and breast more cinnamon, less brown, the belly a deeper yellow, brighter and less buffy.

TYPE.—No. 257,136, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (4000 ft.), Veraguas (Pacific slope) western Panama; Feb. 1, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Mitrephanes aurantiiventris aurantiiventris.—COSTA RICA, 6♂, 3♀, from various localities in the mountains. PANAMA: Boquete, Chiriqui, 4♂.

Mitrephanes aurantiiventris vividus.—PANAMA: Chitrá, Veraguas, 4♂, 1♀.

The form here proposed is distinguishable at a glance from Costa Rican specimens, and is isolated in the Subtropical Zone of the high mountains of Veraguas. Specimens collected by Arcé at Calobre and Calovevora undoubtedly belong here also. The series from Chiriqui collected in 1901 is much browner above than fresh material from Costa Rica in the Dwight Collection, and would be instantly separable, were not this difference undoubtedly ascribable to post mortem change with age. The Veraguas race is a distinct approach to *Mitrephanes berlepschi eminulus* Nelson of eastern Darien in its brighter green back, and brighter yellow underparts, but not sufficiently so in my opinion to prevent their being maintained as distinct species. It is undoubted, however, that starting in Colombia there is a steady progression northward in this genus from green and yellow to brownish olive and russet.

***Heleodytes zonatus panamensis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Heleodytes zonatus costaricensis* (Berlepsch) of the highlands of Costa Rica, but averaging smaller; the black center of the feathers on the pileum reduced in area; the hind neck with a buffier wash; belly and vent averaging slightly deeper ochraceous tawny, the under tail-coverts always spotted with black.

TYPE.—No. 187,573, Amer. Mus. Nat. Hist.; ♂ breeding; Santa Fé, Veraguas, Panama (alt. 2200 ft.); March 6, 1925; R. R. Benson.

SPECIMENS EXAMINED

Heleodytes zonatus costaricensis.—COSTA RICA: 9♂, 2♀ from various localities in the highlands.

Heleodytes zonatus panamensis.—PANAMA: Santa Fé, Veraguas, 4♂, 1?

This species of Cactus Wren which has never before been recorded from Panama, was obtained by Mr. Benson in a locality where Arcé collected extensively. In spite of the wide gap in its range, the new form differs but little from *costaricensis*, in a combination of several slight average characters. The species is a remarkably stable one, as Nicaraguan birds do not differ from Mexican, the Costa Rican race is by no means well marked and, as pointed out by Dr. Chapman, West Ecuador birds are inseparable from *brevirostris* of Bogotá.

MEASUREMENTS

Heleodytes zonatus costaricensis, 9♂ wing, 72 -76.5 tail, 69 -73.5,
 " " *panamensis*, 4♂ " 68.5-72 " 64.5-69.5

***Basileuterus bensoni*, new species**

SPECIFIC CHARACTERS.—Nearest *Basileuterus melanogenys* Baird of the mountains of Costa Rica and Chiriqui, but chestnut crown not so extensively bordered with black; upperparts iron gray instead of olive; underparts white instead of yellow, shaded with deep gray instead of olive; slightly smaller with a proportionately larger bill.

TYPE.—No. 257139, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (4700 ft.), Veraguas, Pacific slope of western Panama; Feb. 26, 1926; Rex R. Benson.

DESCRIPTION OF TYPE.—Crown chestnut, margined very narrowly with black, these two lines converging in front, rendering the forehead black, some of the feathers tipped with white; sides of occiput and nape sooty black; upper back and wing-coverts deep iron or slate-gray, passing through "light dusky green-gray" to medium grayish olive on rump and upper tail-coverts; wings and tail dusky brown, edged with olive; a broad superciliary line of white; lores, orbital and auricular region black, flecked with white on the side of the neck, this color pattern extending across the chin; underparts white; sides of throat and chest, and a broad but vaguely defined breast band deep neutral gray, passing to deep grayish olive on the sides of the anal region; center of abdomen faintly tinged with very pale buff, passing to very pale clear buff on under tail-coverts; wing, 61; tail, 58; culmen, 10.5; tarsus, 22.

SPECIMENS EXAMINED

Basileuterus m. melanogenys.—Mts. of COSTA RICA, 8♂, 6♀, 1?

Basileuterus m. eximius.—Volcan de Chiriqui, PANAMA, 3♂.

Basileuterus bensoni.—Chitrá, Veraguas, 5♂, 3♀.

WING MEASUREMENTS

Basileuterus m. melanogenys.—8♂, 60.5–67

Basileuterus m. eximius.—3♂, 58–65.5

Basileuterus bensoni.—5♂, 55–63

On the basis of the three topotypes available, *Basileuterus melanogenys eximius* Nelson of the Volcan de Chiriqui is a recognizable race, differing in generally paler coloration, very slightly grayer olive above, markedly paler and whiter, less yellow below. It is in no sense an approach to the dark gray and white *Basileuterus bensoni* of the mountains back of Chitrá in extreme eastern Veraguas, a most interesting discovery of Mr. Benson's, and one which I am glad to name in his honor. His series was collected from 4000–5000 ft., the latter altitude representing the tops of the highest peaks. According to Carriker, *B. m. melanogenys* in Costa Rica is found from 6000 ft. to tree-line, and this difference in zonal range may perhaps account in part for the specific characters of its representative in Veraguas. I am permitted to add that the new species has been shown to Mr. W. E. Clyde Todd, now engaged in monographing the genus, and he agrees with me that its characters are specific and not racial. In this connection we must consider *Basileuterus melanogenys ignotus* Nelson, based on one specimen from Mt. Pirri in extreme eastern Panama. This bird is even greener and yellower than typical *melanogenys*, with a greenish yellow superciliary and most of the side of head greenish yellow instead of black. While the type is autoptically unknown to me, these very marked differences appear to me to be of specific value in this group. The relative degree of difference is much greater in this case than the characters separating *Basileuterus tacarcunæ* from *B. tristriatus*. While the former lacks the black on the side of the head of the latter, it is geographically intermediate between undoubted races of *tristriatus*, certainly not the case with *B. melanogenys ignotus*. A binomial name, therefore, would very properly indicate the greater degree of difference of both birds.

***Basileuterus tristriatus chitrensis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to *Basileuterus tristriatus melanotis* Lawrence of the mountains of Costa Rica, but underparts a duller and greener yellow, the breast and chest dirty grayish olive-green, instead of pale yellow, more or less tinged with greenish olive.

TYPE.—No. 257,138, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (4000 ft.), Veraguas, Pacific slope of western Panama; Jan. 29, 1926. Rex R. Benson.

SPECIMENS EXAMINED

Basileuterus tristriatus melanotis.—COSTA RICA, 3 ♂. PANAMA: Chiriqui, 1 ♂.

Basileuterus tristriatus chitrensis.—PANAMA: Veraguas, Santa Fé, 2 ♂; Chitrá, 8 ♂, 7 ♀, 3?

The greenish gray shade underneath and the more heavily washed chest distinguish the new form at a glance, not only from *melanotis* of Costa Rica, but from all the South American races with black ear-coverts, in which the underparts vary from lemon chrome to amber and straw yellow. In the color of the underparts *chitrensis* resembles the distinct species *B. tacarcunæ* Chapman of eastern Panama.

***Basileuterus fulvicauda gaffneyi*, new subspecies**

SUBSPECIFIC CHARACTERS.—Nearest *Basileuterus fulvicauda toddi* nobis, and closely related also to *Basileuterus fulvicauda leucopygius* Sclater and Salvin; ground color of underparts, basal portion of tail and tail-coverts about intermediate between these two; radically different from both, however, in having the chest, sides and flanks heavily washed and clouded with dark grayish olive; chin not so white as in either; supraloral steak as in *leucopygius*.

TYPE.—No. 257, 140, Amer. Mus. Nat. Hist.; ♂ ad.; Guaval, Rio Calovevora, humid tropical forest of Veraguas, Caribbean slope of Western Panama; Aug 22, 1926; Benson and Gaffney; named in honor of Lieutenant Dale V. Gaffney, an aviator at France Field, Canal Zone, who has rendered Mr. Benson invaluable assistance in his explorations, and who accompanied him as volunteer on his expedition across the continent to the Caribbean lowlands of Veraguas, collecting many of the rare and worthwhile specimens.

***Basileuterus fulvicauda toddi*, new subspecies**

SUBSPECIFIC CHARACTERS.—Nearest *Basileuterus fulvicauda leucopygius* Sclater and Salvin of eastern Costa Rica and Nicaragua, but buff of tail-coverts and base of tail a deeper shade (clear buff rather than cream-buff); dark terminal portion of the tail occupying about one-half rather than two-thirds its total length; underparts deeper, more buffy, less white; suffusion of sides and flanks averaging browner, less grayish olive, the spotted appearance on the chest usually much less conspicuous; supraloral streak grayer, less buff.

TYPE.—No. 77,774, Amer. Mus. Nat. Hist.; Boqueron, Chiriqui, Pacific slope of western Panama; Oct. 11, 1901; J. H. Batty.

SPECIMENS EXAMINED

Basileuterus fulvicauda fulvicauda.—Eastern ECUADOR, 4 ♂, 7 ♀.

Basileuterus fulvicauda semicervinus.—West ECUADOR and COLOMBIA, 40 ♂ and ♀. EASTERN PANAMA, 9 ♂, 1 ♀, 2?; Canal Zone, 1 ♂, 1 ♀, 1?

Basileuterus fulvicauda toddi.—Western PANAMA, Pacific slope: Veraguas, interior of Cape Mala Peninsula, 1 ♂, 1 ♀; San Lorenzo River, 1 ♂; Chiriqui, Boqueron, the type. S. W. COSTA RICA, 1 ♂, 2 ♀.

Basileuterus fulvicauda gaffneyi.—Veraguas, Caribbean slope, Rio Calovevora, 3♂.

Basileuterus fulvicauda leucopygius.—Eastern NICARAGUA, 3♂, 3♀. Eastern COSTA RICA, 8♂.

When I collected this species in Veraguas, in 1924, it was apparent that I had a different form from that found in the Canal Zone eastwards. More material from representative localities in western Panama is now at hand, and with nearly 100 specimens before me, including topotypes, it is apparent that our conception of the Central American races of this species must be radically altered. In the first place, Chapman ('Birds of Ecuador,' p. 603) has already recorded the fact that eastern Panama specimens are inseparable from *Basileuterus fulvicauda semicervinus* of western Ecuador. In the second place, Sharpe's *veraguensis* proves to be a composite, and Mr. Ridgway very naturally followed him in his treatment of the species ('Birds of North and Middle America,' Vol. II, pp. 756-758), never having seen an authentic specimen of *semicervinus*. Not only did Sharpe fail to discriminate the radical difference between the Veraguas and the Canal Zone specimens before him, but he overlooked radical differences between all Central American specimens north of the Canal Zone and various South American races, including the type of *semicervinus*. The type of *veraguensis* Sharpe is from Paraiso Station in the Canal Zone. Canal Zone specimens, however, are inseparable from *semicervinus* Sclater of West Ecuador. Consequently, *veraguensis* must become a synonym of the latter. Other specimens cited by Sharpe in his original description ('Cat. Birds Brit. Museum,' X, 1885, p. 403) from Veraguas and Chiriqui undoubtedly belong to the form described above as *toddi*, the characters of which are, however, radically different in many respects from those used by Sharpe to separate his *veraguensis* from *semicervinus*.

The West Ecuador race, *semicervinus* Sclater, differs from all the Central American races in the following ten respects. The upperparts are more olive-green, less brown; the pileum is a clearer, less sooty gray, affording a marked contrast with the back; the underparts are uniform rich buff, only a little darker on the sides and flanks and approaching white on the center of the abdomen; there is no trace below of the dark suffusion, marbling and spotting with olive-brown (*toddi*), olive (*leucopygius*), or deep grayish olive (*gaffneyi*); the dark terminal band of the tail occupies only one-third of its total length; on the outer tail-feathers this dark area is greatly reduced, often represented by faint dusky marks only; the legs and feet are yellowish or pale horn, whereas they are much

darker in the Central American races; the lower mandible is almost always a lighter brown basally, instead of uniformly dark.

So marked, therefore, are the differences separating *leucopygius* and the forms described above from *semicervinus* and typical *fulvicauda*, that it would be entirely permissible in my opinion to regard *leucopygius* as specifically distinct from *fulvicauda* and *semicervinus*, in which case *toddi* and *gaffneyi* would be races of *leucopygius*. In western Panama on the Pacific slope, intergradation between *toddi* and *semicervinus* is ecologically impossible. This bird is a heavy tropical forest species, and the forests of Veraguas are separated from the forests of the Canal Zone by the arid plains and scrubby savannahs of eastern and northern Veraguas and Coclé, where Pipits, Meadowlarks, Red-breasted Blackbirds and *Colinus* are characteristic members of the avifauna. However, this question raises the larger issues of what are specific rather than racial characters in the whole group, a matter entirely outside the purpose of the present paper. It may well be left to Mr. Todd of the Carnegie Museum, now monographing the genus, who has kindly urged me to describe the various new forms in western Panama in advance of his paper, and in a recent visit to this Museum, endorsed the subspecific validity of *gaffneyi*. It is a pleasure to name one of the new forms in his honor.

The characters separating *toddi* and *gaffneyi* from *leucopygius* require no further comment.

***Diglossa plumbea veraguensis*, new subspecies**

SUBSPECIFIC CHARACTERS.—Nearest typical *Diglossa plumbea* Cabanis of the mountains of Costa Rica; adult male differing only in that the blackish slate of the pileum and nape is distinctly demarcated from the deep bluish slate of the back; adult female radically different in being grayer olive both above and below, with a faint but distinct bluish cast above, especially on the wings; immature male in the first stage of plumage differing as does the adult female; in a later stage far more extensively and deeply tinged with cinnamon below, the under tail-coverts bright light cinnamon.

TYPE.—No. 257,137, Amer. Mus. Nat. Hist.; ♂ ad.; Chitrá (5000 ft.), Veraguas, Pacific slope of western Panama; Jan. 30, 1926; Rex R. Benson.

SPECIMENS EXAMINED

Diglossa plumbea plumbea.—Mts. of COSTA RICA, 14 ♂ ad., 5 ♂ imm., 5 ♀ ad.; Volcan de Chiriqui, 1 ♂ imm.

Diglossa plumbea veraguensis.—VERAGUAS, Chitrá, 2 ♂ ad., 2 ♂ imm., 1 ♀ ad.

This distinct new *Diglossa* is another of Mr. Benson's many interesting discoveries in the mountains of eastern Veraguas, and greatly extends the known range of the species. It was breeding at the time of his visit.

NOTES ON *Tanagra anneæ* (CASSIN)

A fine series of this species from the Rio Calovevora, Caribbean slope of Veraguas, western Panama, differs sufficiently from a series of topotypes from eastern Costa Rica to constitute a well-marked subspecies. Adult males have the yellow underparts strongly tinged with tawny orange, especially pronounced on the chest. Females are a distinctly deeper, slaty gray below; the sides and flanks not quite so yellowish olive-green; the crown less strongly tinged with tawny. In addition, the Panama birds are slightly smaller; the wing of seven males from Costa Rica, 63–68.5 (66.1); 10 females from Veraguas, 58.5–66 (62.2). The description of this new race is, however, inadvisable, due to nomenclatural difficulties. It happens that Salvin by a matter of months described *Euphonia rufivertex* from "Santiago," Veraguas (Pacific slope) as a synonym of *E. anneæ*. Two topotypes of *E. rufivertex* before me are exactly intermediate between Costa Rican and Rio Calovevora specimens. As *E. rufivertex* can never be definitely regarded, therefore, as identical subspecifically with *E. anneæ*, and as there is absolutely no room for an intermediate race, the more conservative course is to recognize the existence of a well-marked Veraguas race under the inappropriate name of *Tanagra anneæ rufivertex* (Salvin), topotypes of which will never exhibit the full development of the characters of the subspecies. A single male from the Volcan de Chiriqui is perhaps nearer typical *anneæ*. Incidentally, as a matter of precision, the type locality is erroneous. For many years Arcé made Santiago his headquarters, with various native collectors scouring the province for him. Many of the birds are labelled very generally "Santiago," and none of the heavy-forest species labelled "Santiago" ever occurred there, but were taken in the forest near the coast to the south or in the forest farther in the interior at the base of the mountains. In the case of the species here discussed, it occurs in western Panama on the Pacific slope only in the foothill forests of the mountains, where Arcé obtained it at three different points, and where Mr. Benson also met with it.

I can record one more fact concerning the geographical distribution and variations of this species. An adult male in the American Museum collection was captured at the base of Mt. Tacarcuna, in extreme eastern Panama, on March 14, 1915, by Anthony and Ball. This specimen resembles *T. anneæ rufivertex* in coloration, but is very large, the wing measuring 70 mm. When a series is assembled, the existence of a giant eastern race may be established. The white under tail-coverts and great extension of the tawny cap eliminate the possibility of a new form of *T.*

xanthogastra, a race of which *chocoensis* (Hellmayr) is already known from eastern Panama.

***Chlorothraupis carmioli magnirostris*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar to typical *Chlorothraupis carmioli* (Lawrence) of eastern Costa Rica, but slightly yellower on the chin and throat, less olive-green; size averaging slightly larger, with a much heavier bill, longer, deeper and wider.

TYPE.—No. 187,902, Amer. Mus. Nat. Hist.; ♀ ad.; Santa Fé (2000 ft.), Veraguas, western Panama; March 30, 1925; Rex R. Benson.

***Chlorothraupis carmioli lutescens*, new subspecies**

SUBSPECIFIC CHARACTERS.—Similar also to typical *Chlorothraupis carmioli*, but a much brighter yellow over the entire underparts, the chin almost gamboge yellow with but little green in it, the under tail-coverts also bright yellowish green; size about the same as in typical *carmioli*; the bill intermediate in proportions between *carmioli* and *magnirostris*.

TYPE.—No. 136,327, Amer. Mus. Nat. Hist.; ♂ ad.; Tacarcuna, eastern Panama; March 29, 1915; Wm. B. Richardson.

SPECIMENS EXAMINED

Chlorothraupis carmioli carmioli.—Eastern NICARAGUA, 6♂, 5♀. Eastern COSTA RICA, 7♂, 6♀.

Chlorothraupis carmioli magnirostris.—Western PANAMA: Rio Calovevora, Caribbean slope of Veraguas, 8♂, 4♀; Santa Fé, Pacific slope of Veraguas, 2♂, 1♀.

Chlorothraupis carmioli lutescens.—Eastern PANAMA; base of Mt. Tacarcuna, 12♂, 6♀; Tapalisa, 3♂.

The excellent material listed above greatly increases the previously very limited range accredited to this species. It also shows that it is divisible into three readily recognizable races. It is of interest to note that it occurs on the Pacific slope at Santa Fé in Panama, in a strip of heavy forest at the base of the mountains which has long been known to harbor other species characteristic of the Caribbean slope, and which occur here only on the Pacific slope of western Panama. It is also of interest to record the fact that we have specimens of *Chlorothraupis olivaceus* (Cassin) from the lowland forest of eastern Panama. The existence of a new race of *carmioli* in eastern Panama was discovered independently by Dr. Chapman and me, and I here acknowledge gratefully his kindness in permitting me to describe it.

The series from Nicaragua is just perceptibly yellower below than a Costa Rican series, nowhere nearly enough so, however, to justify formal designation. As might be expected, the Santa Fé birds vary more from the typical form than do the Rio Calovevora specimens. These latter are distinctly intermediate in the development of the bill, but nearer

typical *magnirostris*. Figures do not give a very clear concept of the large size of this bill. In addition to the measurements given in the table below, I might add that in width at the nostrils the series of *magnirostris* averages at least a millimeter greater. The brighter and yellower underparts of *lutescens* distinguish it at a glance.

MEASUREMENTS

		Wing	Exposed Culmen	Depth of Bill at Nostrils
6 ♂	Nicaragua	85 -89.5	16 -17	8.8- 9.2
7 ♂	Costa Rica	85.5-90.5(87.7)	16 -17 (16.4)	9 - 9.7 (9.1)
8 ♂	Rio Calovevora	87 -94	16.5-17.5(16.8)	9.8-10.5(10.3)
2 ♂	Santa Fé	86 -90 (90.0)	17.5-19 (18.2)	11 (11)
14 ♂	East Panama	86 -95	16 -17.5	8.8-10
5 ♀	Nicaragua	83.5-86	15.5-17	8.6-9.3
6 ♀	Costa Rica	85.5-90	16 -17 (16.5)	9.2-10 (9.3)
4 ♀	Rio Calovevora	86 -91.5	16.5-18 (17.3)	10 -11 (10.5)
1 ♀	Santa Fé	88	19 (19.0)	11.5 (11.5)
7 ♀	East Panama	86 -92.5	15.8-17.5	9.5-10

