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## Systematic Notes on the Bird Family Cracidae. No. 5

### *Penelope purpurascens*, *Penelope jacquacu*, and *Penelope obscura*

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*Penelope purpurascens*, *P. jacquacu*, and *P. obscura* are widely distributed, as a group, from Mexico to Uruguay and compose a complex of related forms which are generally similar morphologically and appear to replace one another geographically.

Vuilleumier (1965) concluded, therefore, that they are conspecific, but my study shows, I believe, that the morphological differences between the three forms (which may or may not be completely allopatric) are of specific importance for this group. I therefore recognize three species, with several subspecies each, which are listed here to facilitate the discussion that follows.

- Penelope purpurascens purpurascens* Wagler, 1830
- Penelope purpurascens aequatorialis* Salvadori and Festa, 1900
- Penelope purpurascens brunnescens* Hellmayr and Conover, 1932
- Penelope jacquacu perspicax* Bangs, 1911
- Penelope jacquacu jacquacu* Spix, 1825
- Penelope jacquacu orienticola* Todd, 1932
- Penelope jacquacu granti* Berlepsch, 1908
- Penelope jacquacu speciosa* Todd, 1915
- Penelope obscura bronzina* Hellmayr, 1914
- Penelope obscura obscura* Temminck, 1815
- Penelope obscura bridgesi* Gray, 1860

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The taxonomic treatment of the three species has varied so widely that it must be reviewed briefly. Peters (1934) admitted two species, *P. purpurascens* (in which he included *perspicax*) and *P. obscura*, with which he combined *jacquaçu*. He was confused about *granti*, which he considered to be a synonym of *P. marail* P. L. S. Müller, 1758, but, as Hellmayr and Conover (1942, p. 144) have shown, *marail* and *granti* are two very distinct forms which inhabit the same regions in the Guianas. They are not conspecific, or even closely related, in my opinion.

Hellmayr and Conover (1942) recognized four species, *P. purpurascens* (in which they included *perspicax*), *P. obscura*, *P. jacquaçu* (including *orienticola*), and *P. granti*. Conover and Phelps (1947), who have discussed *granti*, showed conclusively that *orienticola* is conspecific with *granti* because the two are connected by intermediate populations in British Guiana and Venezuela. But Conover and Phelps were of the opinion that *granti* and *orienticola* were not conspecific with *P. jacquaçu* because of differences in the coloration of the back and primaries. However, these differences are clearly of subspecific importance only, and Conover and Phelps granted that intermediates between nominate *jacquaçu* and *orienticola* might exist. I have not examined specimens from regions where intergradation could be expected, but Dugand (1952) has discussed some specimens from southeastern Colombia in terms that suggest that they are intermediate between nominate *jacquaçu* and *orienticola*. In these specimens, which were taken at two localities on the Rio Apaporis at about longitude 71° W. by latitude 0° 07' N., the general coloration of the back is more similar to that of *orienticola*, but that of the primaries is similar to that of nominate *jacquaçu*.

Blake (1955) combined *P. purpurascens* and *P. jacquaçu*,<sup>1</sup> but kept *P. obscura* as a separate species because of differences in proportions. Vuilleumier (1965) did not believe this difference was of specific importance and stated, "I only recognize one species in this complex," which he called *P. purpurascens*, although its correct name should be *P. obscura* if only one species is recognized, *obscura* Temminck, 1815, being the oldest name in the complex.

### MORPHOLOGICAL DIFFERENCES

The three species differ in proportions, in the shape of the crest, the color pattern of some feathers, or the color of the bare skin of the tarsus in life, or by a combination of these characters.

*Penelope jacquaçu* is a smaller and more slender bird than *P. purpurascens*,

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<sup>1</sup> Blake has informed me (*in litt.*) that he has since repudiated his former opinion as to the conspecificity of these two forms.

TABLE 1

DIFFERENCE BETWEEN THE LENGTHS OF THE WING AND TAIL IN ADULTS AND SUBADULTS OF BOTH SEXES OF *Penelope purpurascens*, *Penelope jacquaçu*, AND *Penelope obscura*  
(The numbers in each category refer to the number of specimens.)

	Tail Shorter than Wing	Tail and Wing Equal	Tail Longer than Wing
<i>P. purpurascens</i>	254	0	0
<i>P. jacquaçu</i>	3	3	195
<i>P. obscura</i>	22	6	20

and its tail is almost invariably longer than the wing, whereas the reverse is true in all the specimens of *purpurascens* that I have seen (table 1), a remarkably constant difference in proportions which is evident at first glance in well-made skins but which does not seem to have been mentioned before. In *P. obscura* the tail is either slightly longer or shorter than the wing in about the same number of specimens, the dusky or blackish color of its tarsus being evidently of greater specific importance than the difference in proportions. The tarsus is red in *P. jacquaçu* and *P. purpurascens*.

In adult males of all the races of *P. purpurascens* of which the sample consisted of five or more specimens (table 2), the ratio of the length of the tail to that of the wing varied from 0.88 to 0.95, with an average of 0.91 for nine populations. In adult males of all the races of *P. jacquaçu* it varied from 1.02 to 1.05, with an average of 1.035 for five populations. Four specimens of *jacquaçu* in which the tip of the tail was too badly worn for me to be sure whether or not it had been longer than the wing were not included in table 1.

*Penelope purpurascens* and *P. jacquaçu* differ also distinctly by the shape of the crest, and by the color pattern of its feathers and of those of the scapulars and mantle. The crest of *purpurascens* is "bushy," but that of *jacquaçu* is "flatter" and more compact. The crest feathers of *purpurascens* are relatively short and are very broad and strongly rounded at the tip, whereas those of *jacquaçu* are more prolonged, narrower, and more or less attenuated at the tip.

The color pattern of the feathers of the crest and of those of the scapulars and mantle in *purpurascens* and *jacquaçu* provide an instance of character displacement which would be normal if the two birds are separate species and is associated with the differences in the shape of the crest, general size (table 2), and proportions (shorter or longer tail). In nominate *purpurascens* (the range of which is far removed from that of *jacquaçu*), the short anterior feathers of the crest are narrowly edged with grayish

TABLE 2  
 MEASUREMENTS OF ADULT MALES OF *Penelope purpurascens*, *Penelope jacquacu*,  
 AND *Penelope obscura*

(The number in parentheses in the range denotes the size of the sample.  
 The standard deviation was not computed  
 for samples of fewer than five.)

Form and/or Population	Wing	Tail	Tarsus	Exposed Culmen
<i>P. p. purpurascens</i>				
Mexico				
Mean	399.0	370.7	80.0	37.5
Range	385-425 (12)	340-392 (12)	75-86 (12)	30-44 (12)
$\sigma$	12.76	15.66	3.76	1.19
Guatemala				
Mean	390.0	372.0	82.0	37.6
Range	360-410 (12)	350-390 (12)	76-87 (12)	34-45 (12)
$\sigma$	13.05	13.21	3.95	3.74
Honduras and Nicaragua				
Mean	387.3	347.0	80.7	34.0
Range	362-416 (8)	325-365 (7)	78-84 (8)	32-37 (7)
$\sigma$	21.74	14.09	1.64	1.68
<i>P. p. aequatorialis</i>				
Costa Rica				
Mean	380.6	340.8	81.0	34.4
Range	369-398 (9)	320-370 (9)	77-85 (9)	33-37 (9)
$\sigma$	11.16	15.30	3.0	1.58
Panama				
Mean	371.3	338.0	78.0	33.4
Range	352-386 (12)	300-360 (12)	70-89 (12)	31-37 (12)
$\sigma$	12.19	17.81	5.21	2.10
Colombia				
Mean	368.7	333.0	76.7	32.8
Range	350-390 (30)	310-370 (30)	71-86 (30)	27-36 (30)
$\sigma$	10.75	14.52	3.20	1.91
Venezuela				
Mean	361.07	333.5	—	32.8
Range	344-373 (13)	316-349 (13)	—	31-34 (13)
$\sigma$	7.33	11.07	—	1.03
Ecuador				
Mean	356.2	326.0	77.6	32.5
Range	350-365 (5)	305-340 (5)	72-82 (5)	30-35 (5)
$\sigma$	6.49	13.88	3.76	1.90
<i>P. p. brunnescens</i>				
Mean	359.3	320.0	74.0	32.7
Range	340-374 (13)	290-340 (13)	70-78 (13)	29-36 (13)
$\sigma$	8.17	15.36	2.58	1.83

TABLE 2—(Continued)

Form and/or Population	Wing	Tail	Tarsus	Exposed Culmen
<i>P. j. perspicax</i>				
Mean	313.6	322.8	76.3	31.5
Range	302–332 (11)	308–343 (11)	73–80 (11)	30–33 (11)
$\sigma$	7.64	8.81	2.36	1.09
<i>P. j. jacquaçu</i>				
Mean	303.85	315.85	74.7	30.7
Range	280–330 (67)	292–350 (60)	67–88 (68)	26–36 (68)
$\sigma$	10.98	12.57	4.32	1.94
<i>P. j. orienticola</i> <sup>a</sup>				
Mean	307.29	323.5	78.3	33.3
Range	285–325 (21)	310–343 (18)	72–84 (22)	30–37 (22)
$\sigma$	8.78	10.56	3.16	2.03
<i>P. j. granti</i>				
Mean	336.87	345.0	80.75	34.2
Range	310–354 (8)	325–375 (8)	75–84 (8)	32–37 (8)
$\sigma$	13.35	16.02	2.85	1.66
<i>P. j. speciosa</i>				
Mean	322.9	328.48	77.48	30.48
Range	290–351 (19)	305–345 (17)	72–85 (19)	28–35 (19)
$\sigma$	13.25	11.33	3.46	1.71
<i>P. o. bronzina</i>				
Mean	315.4	302.8	75.0	31.6
Range	304–323 (5)	285–312 (5)	70–81 (5)	29–34 (5)
$\sigma$	3.96	4.89	2.98	1.78
<i>P. o. obscura</i>				
Mean	303.6	285.0	72.3	25.3
Range	301–305 (3)	280, 290 (2)	68–77 (3)	24–26 (3)
<i>P. o. bridgesi</i>				
Mean	328.1	330.9	78.58	30.4
Range	291–346 (19)	305–345 (19)	72–85 (19)	27–34 (19)
$\sigma$	12.77	10.90	3.49	2.14

<sup>a</sup>Four males from Venezuela, which are intermediate between *orienticola* and *granti*, measure: wing, 313–335 (mean 326); tail, 320–345 (335); tarsus, 73–80 (76.25); exposed culmen, 32–34 (33.25).

white at the sides, as a rule, and the scapulars and feathers of the mantle are edged with white somewhat as in *jacquaçu*. But in the populations of *P. purpurascens* (*aequatorialis* and *brunnescens*), the ranges of which approach and may come in contact with the range of *P. jacquaçu*, the anterior feathers of the crest lack the pale edges. These edges are lacking also on the scapulars and mantle in virtually all the specimens of the very large series that I have seen, persisting only as faint and very slight traces in two or

TABLE 3  
 MEASUREMENTS OF ADULT FEMALES OF *Penelope purpurascens*, *Penelope jacquacu*,  
 AND *Penelope obscura*

(The number in parentheses in the range denotes the size of the sample.  
 The standard deviation was not computed  
 for samples of fewer than five.)

Form and/or Population	Wing	Tail	Tarsus	Exposed Culmen
<i>P. p. purpurascens</i>				
Mexico				
Mean	391.0	378.3	82.5	35.2
Range	360-428 (16)	350-415 (17)	74-91 (17)	31-43 (17)
$\sigma$	15.02	19.18	3.95	3.12
Guatemala				
Mean	381.5	355.3	81.5	35.5
Range	350-405 (9)	325-375 (10)	78-85 (10)	33-42 (9)
$\sigma$	16.98	16.04	2.40	3.21
Honduras and Nicaragua				
Mean	379.7	345.5	80.5	33.5
Range	362-410 (11)	316-370 (11)	75-85 (11)	31-36 (11)
$\sigma$	16.32	16.23	3.07	1.49
<i>P. p. aequatorialis</i>				
Costa Rica				
Mean	352.5	330.0	78.0	33.6
Range	342-370 (4)	300-350 (4)	74-81 (4)	31-39 (4)
Panama				
Mean	358.1	329.6	80.0	33.0
Range	343-376 (11)	310-345 (11)	75-87 (11)	30-37 (11)
$\sigma$	9.70	9.19	4.38	2.30
Colombia				
Mean	350.1	325.0	75.0	31.9
Range	338-368 (18)	295-350 (18)	65-83 (18)	26-36 (18)
$\sigma$	8.01	12.37	4.20	2.29
Venezuela				
Mean	342.64	323.8	—	31.0
Range	330-365 (9)	308-346 (9)	—	29-34 (8)
$\sigma$	12.09	10.26	—	1.45
Ecuador				
Mean	353.0	318.7	78.0	33.3
Range	336-370 (6)	310-342 (6)	70-83 (6)	31-36 (6)
$\sigma$	13.97	11.19	4.69	1.85
<i>P. p. brunnescens</i>				
Mean	345.6	317.0	75.0	33.3
Range	330-353 (10)	280-338 (10)	72-80 (10)	31-37 (10)
$\sigma$	7.08	16.32	2.51	1.76

TABLE 3—(Continued)

Form and/or Population	Wing	Tail	Tarsus	Exposed Culmen
<i>P. j. perspicax</i>				
Mean	292.4	307.4	72.7	30.5
Range	285–302 (7)	290–323 (6)	71–75 (7)	28–32 (7)
$\sigma$	7.10	14.66	1.77	1.89
<i>P. j. jacquaçu</i>				
Mean	290.3	303.7	71.9	29.9
Range	270–312 (37)	273–330 (33)	63–80 (37)	27–34 (36)
$\sigma$	11.37	12.62	3.61	1.92
<i>P. j. orienticola</i> <sup>a</sup>				
Mean	289.0	304.0	77.5	32.7
Range	283–297 (5)	300–310 (4)	73–83 (6)	31–36 (6)
$\sigma$	6.12	—	3.86	1.72
<i>P. j. granti</i>				
Mean	321.1	327.0	74.1	32.3
Range	316–327 (6)	315–345 (6)	70–78 (6)	30–35 (6)
$\sigma$	3.60	11.47	2.92	1.62
<i>P. j. speciosa</i>				
Mean	310.0	315.7	76.1	30.0
Range	302–333 (11)	305–340 (11)	72–82 (11)	28–32 (11)
$\sigma$	9.03	11.47	3.23	1.71
<i>P. o. bronzinga</i>				
Mean	294.0	302.0	74.1	30.0
Range	270–309 (8)	285–325 (6)	71–79 (8)	28–32 (8)
$\sigma$	13.27	13.71	2.74	1.41
<i>P. o. obscura</i>				
Mean	290.3	277.5	68.0	25.3
Range	285–301 (3)	275, 280 (2)	65–72 (3)	22–27 (3)
<i>P. o. bridgesi</i>				
Mean	322.0	333.3	77.5	30.0
Range	298–335 (9)	320–365 (9)	72–84 (9)	29–32 (9)
$\sigma$	12.31	13.69	4.24	1.14

<sup>a</sup> Five females from Venezuela, which are intermediate between *orienticola* and *granti*, measure: wing, 306–321 (mean 315); tail, 315–340 (327.6); tarsus, 68–76 (71.6); exposed culmen, 30–32 (31.4).

three individuals. In *jacquaçu*, on the other hand, all the feathers of the crest are invariably edged with grayish white, and the scapulars and feathers of the mantle are well edged with grayish or buffy white.

The difference in proportions breaks down in the case of *P. obscura* but is replaced as a species character by a very striking difference in the color of the tarsus which is red in *jacquaçu* and *purpurascens* but black or dusky in

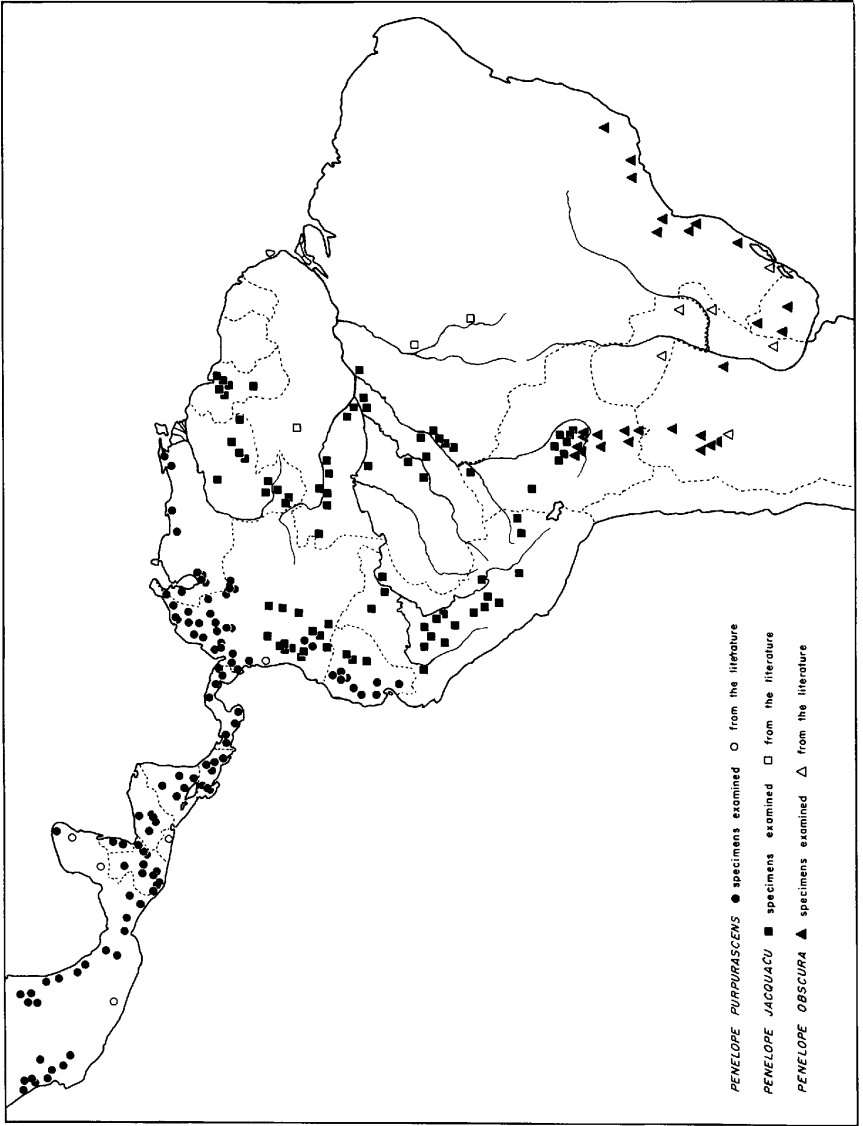


FIG. 1. Distribution of *Penelope purpurascens*, *Penelope jacquacu*, and *Penelope obscura*.



all the races of *obscura*. Hellmayr and Conover (1942, p. 141) stated that it is "inexpedient to merge *P. jacquaçu* and *P. obscura* into a single specific entity" because of the many differences between *P. jacquaçu speciosa* and *P. obscura bridgesi*, the ranges of which approach very closely in Bolivia (fig. 1) and may come into contact. They mentioned, among the many differences, that the tarsus of *bridgesi* is "dark brown (instead of crimson)" [in *speciosa*]. The tarsus is dark brown in many older skins of *obscura*, but in all the subspecies of *obscura* the collectors noted on the labels of the specimens that I have seen that the tarsus in life had been "dark," "horn dark," "noir brun," "blackish," or "black," or that the "feet" had been "negros"; red or any shade of red was not noted. In the case of *bridgesi* only black was mentioned.

Hellmayr and Conover (*loc. cit.*) mentioned a number of other differences between *bridgesi* and *speciosa*, namely, that the latter had a longer and more slender bill, shorter toes, "shorter and practically unfeathered tarsus," and a longer crest. The bill of *speciosa* is perhaps slightly more slender than that of *bridgesi*, but this difference may be individual as my measurements (tables 2, 3) do not confirm any appreciable differences in size or proportions in the length of the bill, tarsus, and tail, and I also cannot confirm a difference in the degree of the feathering of the tarsus. But the crest of *speciosa* is certainly very different from that of *bridgesi*. Its feathers are more attenuated, much more elongated, and all of them are conspicuously edged with grayish white, the pale edges being confluent at the tip or virtually so, whereas the pale edges in *bridgesi* are restricted to the feathers on the anterior part of the crown and do not reach the tip of the feather. The entire crest of *speciosa* is also paler than that of *bridgesi*, gray rather than dark brown, and other clear-cut differences exist in coloration. The malar stripe of *bridgesi* is dark brown and uniform, but that of *speciosa* is variegated with gray. The pale edges of the scapulars and upper wing coverts of *bridgesi* are purer white, broader, and much more conspicuous than those of *speciosa*, and, in fact, the entire aspect of the plumage is different. *Bridgesi* is a much browner bird throughout, not "oily" bronze-green on the back as is *speciosa*, and is virtually uniform below, whereas the upper breast of *speciosa* is olive-green and contrasts strongly with the abdomen, which is rufous, nearly chestnut.

Many differences thus distinguish the two birds, which apparently were not taken into account by Vuilleumier (1965, p. 15) when he concluded that they were conspecific. He seems to have investigated only the possibility of differences in proportions, concluding "that these differences are no more than clinal, with perhaps a sharper step between *speciosa* and *bridgesi*." The measurements in tables 2 and 3 show that differences in

proportions do not exist or are not appreciable, but in all other characters there is no evidence whatever of clinal variation.

*Penelope obscura* and *P. jacquaçu* thus appear to be distinct species, and neither is conspecific with *P. purpurascens*, although the three species are clearly related and seem to compose but one complex. The ranges of *P. purpurascens* and *P. obscura* are interrupted by the range of the intervening *P. jacquaçu* (fig. 1), and *obscura* is about as distinct morphologically from *purpurascens* as the latter is from *jacquaçu*. The tarsus of *purpurascens* is red or reddish also, not black or blackish as is that of *obscura*. The latter is also very distinctly smaller than *purpurascens* (tables 2 and 3), has a different crest, which is more similar to that of *jacquaçu* on the whole or less well developed, and differs in many details of coloration. Intermediates between the three species are unknown.

To return to the status of *perspicax*. Peters, Hellmayr and Conover, and Blake, who are cited above, considered that it is a subspecies of *P. purpurascens*, but Chapman (1917, p. 195) and de Schauensee (1964, p. 62) believed that it was a full species. Chapman noticed, however, that the pattern of the feathers of the mantle was the same in *perspicax* and *jacquaçu*, differing "markedly" from that of *purpurascens* (which he called *cristata*) but he did not pursue the significance of this similarity. De Schauensee had expressed earlier (1948, p. 417) his observation that *perspicax* and *P. purpurascens aequatorialis* "seem to inhabit more or less the same country in western Colombia." My study has shown, however, that *perspicax* agrees perfectly with *P. jacquaçu* in all the characters of specific importance (tail longer than the wing,<sup>1</sup> general size, shape of the crest, and color pattern of the feathers of the crest, scapulars, and mantle), but not with *purpurascens*. It should be treated, therefore, as a subspecies of *P. jacquaçu*, not as a subspecies of *P. purpurascens* or as a separate species.

The character of *perspicax* that unfortunately has received the most attention was the "coppery auburn" or reddish brown tinge of its primaries and central tail feathers. But this character, which is only of subspecific importance, has proved to be misleading, as it occurs also in the populations of *purpurascens* from Colombia, in which it varies individually as shown by Blake (1955), a fact that led Blake to consider that *P. purpurascens* and *P. jacquaçu* were conspecific, an opinion that he no longer holds.

## DISTRIBUTION

The distribution of the three species is shown in figure 1. The range of

<sup>1</sup> In the males of *perspicax* in table 2 the tail and wing ratio is 1.04, as against, in the males of the populations of *purpurascens* from Colombia, 0.90 in *aequatorialis* and 0.88 in *brunnescens*.

*jacquaçu* was believed to extend eastward only to the Rio Madeira until very recently when Sick (1965) discovered nominate *jacquaçu* much farther east on the Rio Cururu and the Rio Teles Pires at the headwaters of the Rio Tapajoz. Sick believes the range extends very probably still farther east to the headwaters of the Rio Xingu. The two localities where Sick collected specimens on the upper Tapajoz are shown in figure 1.

The two regions of greatest interest are southern Colombia, where the range of *P. purpurascens* is virtually surrounded by that of *P. jacquaçu*, and central Bolivia, where *P. jacquaçu* and *P. obscura* have been collected at localities not very far apart.

The situation in Colombia (fig. 2) is the most puzzling because the range of *P. purpurascens* is nearly encompassed by that of *P. jacquaçu* in the south. All the authors agree that the range of *purpurascens* extends through the Magdalena Valley to its headwaters, and the only specimens that I have seen from this valley are birds from Belen and La Candela which apparently constitute the southernmost records. These two localities are in Huila in the valley of the upper Magdalena. Belen is situated at an altitude of 7000 feet, 45 kilometers southwest of La Plata. La Candela is farther south, being situated, according to de Schauensee (1948, p. 290), "in the giant primeval forest at the head of the Magdalena Valley, a day's journey west of San Agustin." Specimens of nominate *jacquaçu* have been examined by me from localities south and east of the Magdalena Valley and of the Eastern Andes (from Puerto Umbria on the upper Putumayo north through Florencia to Villavicencio), as have specimens of *P. j. perspicax* from both slopes of the Western Andes and the west slope of the Central Andes (or from the Rio Mechengue, and Munchique "Tambo," north to Salento "Quindio," which is situated northeast of Armenia on the west slope of the Central Andes). The range of *P. purpurascens* is therefore virtually surrounded by that of *P. jacquaçu* to the west, south, and east and consists apparently of only a narrow tongue penetrating the Magdalena Valley to its headwaters.

There is no evidence of overlap, although this had been implied by de Schauensee (1949, pp. 416, 417) when he listed the Rio Mechengue as a locality in the ranges of both *purpurascens* and *perspicax*. But this was an error as de Schauensee has kindly informed me. The mention of this locality in the range of *purpurascens* was inadvertent, as the Academy of Natural Sciences of Philadelphia does not have a specimen of this species from the Rio Mechengue.

Figure 2 is semidiagrammatic. The contour of 2000 meters is approximate only, and the southern limits of the range of *P. purpurascens* in Antioquia and Arauca are unknown to me. The southernmost record of this

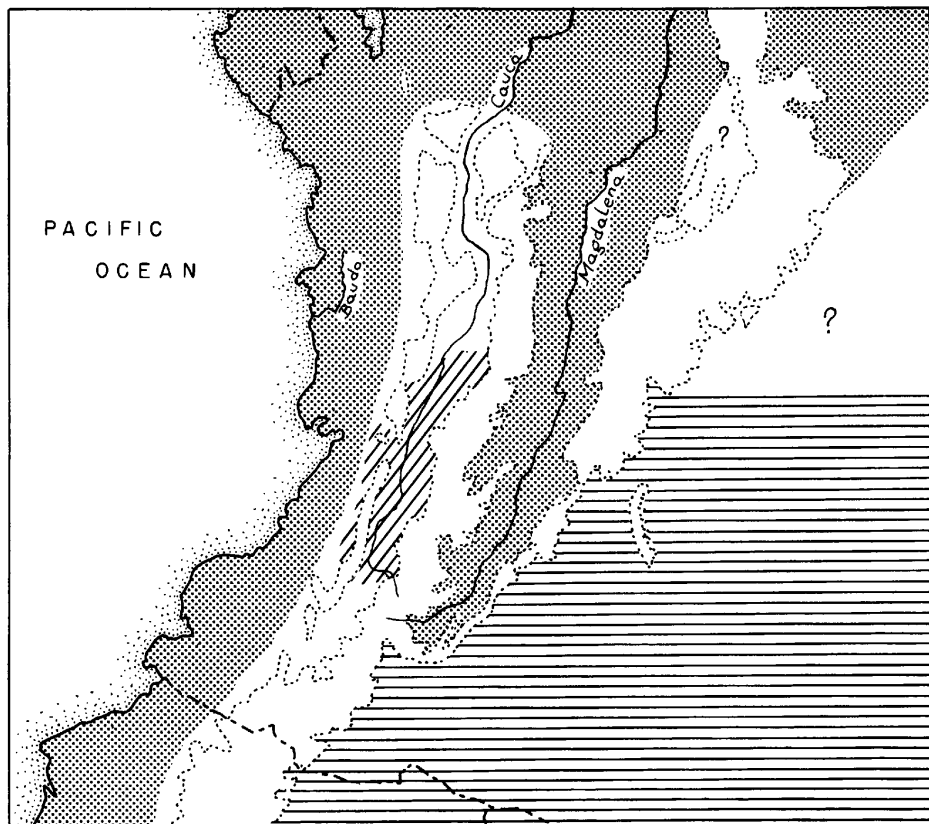


FIG. 2. Distribution of *Penelope purpurascens* and *Penelope jacquaçu* in central and western Colombia and neighboring Panama and Ecuador. The stippled area indicates the range of *P. purpurascens*; the diagonal lines show the range of *P. jacquaçu perspicax*; and the horizontal lines, that of nominate *jacquaçu*. The approximate contour of 2000 meters is shown by dotted lines.

species along the Pacific coast of Colombia is apparently from the Rio Baudo. I know of no other farther south until Ecuador is reached, but, presumably, the range is continuous along the coastal districts, as is shown in figure 2. The northernmost records of *P. jacquaçu* east of the Andes are from the region of Villavicencio and the Rio Upia, but the range may extend farther north.

The ranges of *P. jacquaçu* and *P. obscura* approach closely in central Bolivia. The southernmost records of *P. jacquaçu speciosa* seem to be all from the general region of Buena Vista in Santa Cruz, whence I have seen a number of specimens. These were from Buena Vista itself, which is at latitude 17° 21' S., longitude 63° 38' W., at an elevation of about 500 meters, or the specimens were taken west, and perhaps also southwest, of

Buena Vista on the Surutu, Yapacani, and Ichilo rivers, but the collector unfortunately did not indicate the precise locality on the rivers or the elevation. The northernmost specimens of *P. obscura bridgesi* that I have seen were taken at Comarapa, Santa Cruz, which is at latitude 17° 52' S., longitude 64° 35' W., at an elevation of about 1940 meters, or in nearby Cochabamba on the road from Comarapa to Totora, a locality somewhat farther west and north of Comarapa. The distance between the towns of Comarapa and Buena Vista is about 105 kilometers, but if the specimens from the Rio Yapacani had been taken somewhere northeast of Comarapa, the gap between *jacquaçu* and *obscura* would be narrowed to about 50 kilometers. It would appear that *obscura* is found at higher altitudes than *jacquaçu* in the region where their ranges approach, but that it does is not certain because *obscura* is found also at low altitudes in Bolivia, as witness a specimen collected farther south at Villa Montes, Tarija, which is at an elevation of only 440 meters.

There is at present no evidence, therefore, that the ranges of the three species overlap, or even come into contact, but the distribution requires further investigation because the sharp morphological dissimilarities where the ranges approach closely do suggest the possibility of contact, at least in Bolivia. In Colombia, on the other hand, the higher altitudes of the Central and Eastern Andes probably keep *purpurascens* and *jacquaçu* apart by forming an effective ecological barrier.

## GEOGRAPHICAL VARIATION

The three species vary geographically, and *purpurascens* can be divided into three subspecies; *jacquaçu*, into five; and *obscura*, into three.

### *Penelope purpurascens*

The geographical variation of *purpurascens* is relatively slight and consists chiefly of clinal variations in size and coloration.

Nominate *purpurascens* Wagler, 1830, type locality, "Mexico" ("probably state of Vera Cruz" as suggested by Hellmayr), is the largest and darkest subspecies and ranges from southern Sinaloa and the region of Ciudad Victoria in Tamaulipas south to Honduras and Nicaragua where it grades into *aequatorialis*. It differs also from *aequatorialis* and *brunnescens* by having the scapulars and feathers of the mantle edged with white, and almost invariably by having the short anterior feathers of the crown narrowly edged with grayish white. The population of Mexico varies individually, and some specimens, which are more common in

eastern than western Mexico, are more rufescent than normal and approach the coloration of *aequatorialis* to some extent. The birds of Honduras and Nicaragua are also more rufescent but, on the whole, are more similar to the birds of Guatemala and Mexico than they are to *aequatorialis*.

*Penelope purpurascens aequatorialis* Salvadori and Festa, 1900, type locality, Rio Pepipa, Ecuador, replaces nominate *purpurascens* southward and is more rufescent throughout but less rufous than *brunnescens*. The latter and *aequatorialis* average also smaller than nominate *purpurascens*, and both lack pale edges on the feathers of the fore crown, scapulars, and mantle which are characteristic of nominate *purpurascens*, although a few traces of edges persist on the scapulars and mantle in a very occasional specimen. The measurements of *aequatorialis* (tables 2 and 3) decline gradually from Costa Rica to Ecuador, but the males from Venezuela average a little larger than the birds of Ecuador, although apparently not the females.

The coloration of the birds of Costa Rica, Panama, western Colombia, and Ecuador is essentially similar, but the birds of Venezuela vary more individually, and the individual variation is greatest in northern Colombia, the valley of the Rio Magdalena, and northwestern Arauca. Some of the individuals from these three regions are more rufous than typical *aequatorialis* and virtually indistinguishable from *brunnescens*, and this variability poses a problem of subspecific identity. In my opinion, however, it is best to restrict the range of *brunnescens* to the Santa Marta Massif and the basin of Lake Maracaibo where this subspecies is reasonably constant but not well differentiated at best. The populations from the rest of Colombia and Venezuela are best referred to *aequatorialis*, this species being restricted in Venezuela to the region north of the Orinoco, *P. jacquaçu* replacing *P. purpurascens* south of this river.

To be sure, some specimens that I have seen from Huila in the Magdalena Valley and from northwestern Arauca are virtually identical to topotypical *brunnescens*, but others are more similar to topotypical *aequatorialis*. Hellmayr and Conover (1942, p. 138) and de Schauensee (1948, p. 417) have included the population from the entire Magdalena Valley in the range of *brunnescens*, but the material that I have seen shows that this population varies individually to a greater extent than had been suspected. Blake (1955), who discussed the individual variation of material from Bolivar and northern Antioquia, had already suggested that the subspecific status of the birds from the lower Rio Magdalena should be re-investigated. The birds of Venezuela are certainly less variable, and there is no question that their correct name is *aequatorialis*, but some are more rufous, especially one from Cristobal Colon at the tip of the Paria

Peninsula which is quite similar to *brunnescens*, although Cristobal Colon is far removed from Lake Maracaibo, being situated at the eastern extremity of the range.

The range of *aequatorialis* is presumably continuous along the Pacific coast from Colombia to western Ecuador, but the southernmost record in Colombia is apparently the Rio Baudo, and I know of no other farther south along the Pacific until Ecuador is reached.

*Penelope purpurascens brunnescens* Hellmayr and Conover, 1932, type locality, Rio Cogollo, Perija [Zulia], Venezuela. This subspecies and its range are discussed above. The more rufous coloration of *brunnescens* is more evident on the upper surface of the inner secondaries, upper coverts, and central tail feathers, and on the rump. The difference between "typical" specimens of the two subspecies is clear, but, as stated above, some specimens of *aequatorialis* resemble the birds of the Santa Marta region and of the basin of Lake Maracaibo, and a few specimens from these regions differ only slightly from topotypical *aequatorialis*.

#### *Penelope jacquaçu*

The geographical variation of *P. jacquaçu* is better marked than that of *P. purpurascens*, and its five subspecies are about equally well differentiated. This species also varies much less individually than *P. purpurascens*. The geographical variation consists of variations in size, coloration, and the development of the crest, and four subspecies (nominate *jacquaçu*, *orienticola*, *granti*, and *speciosa*) intergrade, but the fifth (*perspicax*) is isolated geographically from the other populations.

1. *Penelope jacquaçu perspicax* Bangs, 1911, type locality, San Luis, Bitaco Valley, Western Andes, Colombia. This subspecies inhabits the Cauca Valley and the west slope of the Central Andes and both slopes of the Western Andes of Colombia. It is isolated from the range of nominate *jacquaçu*, which inhabits the Amazon Basin, by the Eastern Andes and by a southern extension of the range *P. purpurascens* which follows the valley of the Magdalena River to its headwaters. The specimen of *perspicax* collected farthest north that I have seen was taken at Salento on the west slope of the Central Andes, or at about latitude 4° 38' N., and the southernmost between Cerro Munchique and El Tambo on the east slope of the Western Andes, or at about latitude 2° 27' N. The range of *perspicax* thus appears to be somewhat restricted but may be a little more extensive than these records indicate.

*Perspicax* is more similar to nominate *jacquaçu* of the Amazon Basin than it is to the other subspecies, but it averages a little larger and is distinctly more rufous above although not below. The rump of *perspicax* is

more reddish, less brownish, than that of nominate *jacquaçu*, and the upper surface of its inner secondaries and tail is reddish brown, more or less "coppery," as against bronzy olive-green in nominate *jacquaçu*, but the under parts of *perspicax* are much less rufescent than those of nominate *jacquaçu*. The development of the crest and the shape of its individual feathers are similar in *perspicax* and nominate *jacquaçu*. The feathers of the crown are edged with grayish white to the same extent, but the pale edges of the scapulars and feathers of the mantle are usually narrower in *perspicax* and less conspicuous. On the other hand, the whitish markings of the under parts are better developed in *perspicax* than in nominate *jacquaçu*. The malar stripe is dark brown and uniform in these two subspecies, not variegated with grayish white.

2. *Penelope jacquaçu jacquaçu* Spix, 1825, type locality, Rio Solimões, Brazil, restricted to Coary on the south bank of the Solimões by Hellmayr and Conover (1942, p. 142). This subspecies has a very extensive range in the Amazon Basin, extending from Colombia, where it ranges north along the base of the Eastern Andes to at least the region of Villavicencio, south through Ecuador and Peru to extreme northern Bolivia, and east to the upper Tapajoz and perhaps the headwaters of the Xingu. It is replaced by *orienticola* on the north bank of the Solimões and Amazon. I have not seen specimens from the Tapajoz, where the species has been found only very recently, but according to Sick (1965), who discovered it in this region, birds from the Tapajoz agree perfectly ("*coincidem perfeitamente*") with a series of nominate *jacquaçu* from the Rio Purus and the Rio Jurua. Nominate *jacquaçu* seems to intergrade with *speciosa* in northern Bolivia, judged by the only specimen that I have seen from this region, a subadult bird taken on the lower Beni River which shows a tendency toward *speciosa*, although it is more similar to nominate *jacquaçu*. The specimens reported by Dugand (1952) from the lower Apaporis River in southeastern Colombia suggest very definitely that nominate *jacquaçu* and *orienticola* intergrade in this region.

3. *Penelope jacquaçu orienticola* Todd, 1932, type locality, Manacapuru, north bank of the lower Solimões (about 70 kilometers west of Manaus). This subspecies, which replaces nominate *jacquaçu* north of the Solimões and Amazon, is intermediate in size and coloration between nominate *jacquaçu* and *granti*. It is darker above, greener, much less bronzy, than nominate *jacquaçu*, and is much less rufescent on the rump and under parts. The latter are brownish and the individual feathers of the abdomen are more or less heavily vermiculated with dark brown on a dull rufescent ground, whereas nominate *jacquaçu* is not vermiculated as a rule. The development of the crest and the shape of its individual feathers are similar



in *orienticola* and nominate *jacquaçu*, but the pale edges of the feathers are less well developed in *orienticola*, and the pale edges of the scapulars and feathers of the mantle are also less developed in *orienticola*. The malar stripe of *orienticola* is variegated with grayish white, it is not uniformly brown as in nominate *jacquaçu*, and *orienticola* differs also from nominate *jacquaçu* by having distinctly paler primaries. The webs of the latter are pale brown in *orienticola* and contrast in color with the rest of the wing, whereas the primaries do not contrast and are dark greenish brown in nominate *jacquaçu*.

The northern limits of the range of *orienticola* cannot be defined with certainty, as this subspecies intergrades with *granti* over a very broad zone in southern Venezuela and probably western and southern British Guiana. Nevertheless, it seems to me that the range ascribed to *granti* in Venezuela by Phelps and Phelps (1958, p. 80), which consists of the entire state of Bolívar to the extreme northwestern corner of the Territorio de Amazonas, is much too extensive. It is best restricted to northeastern Bolívar east of the Rio Paragua. In a discussion of the ranges in Venezuela published earlier, Conover and Phelps (1947) had identified as intermediates specimens from the northwestern corner of the Territorio de Amazonas (Caño Cataniapo), from Bolívar (Arabupu near Roraima, Auyan-tepui, and the Rio Paragua), and also from the upper Kamarang River in British Guiana. I believe Conover and Phelps were correct because the specimens that I have seen from Roraima, Auyan-tepui, and the Rio Paragua are certainly intermediate, although one from Raudal Capuri on the upper Paragua is best identified as *granti* which it matches in coloration though not in size. I have not seen specimens from the Caño Cataniapo, but I can scarcely credit that the birds of this region are *granti* or even truly intermediate, because one specimen that I have examined from the lower Rio Caura, which is much farther east, is actually more similar to *orienticola* than it is to *granti*.

4. *Penelope jacquaçu granti* Berlepsch, 1908, new name for *Penelope marail* of Ogilvie-Grant (not *Penelope marail* P. L. S. Müller), type locality, Takutu River, British Guiana. This subspecies differs from *orienticola* by averaging larger and by being darker throughout, more bluish green above, and darker brown below. The development of the crest, the shape and pale edges of its feathers, and also the coloration of the malar stripe are about the same in *orienticola* and *granti*, but in some individuals of *granti* the malar stripe is more mixed with grayish white. The pale edges of the scapulars and feathers of the mantle are usually less developed in *granti*, but the webs of its primaries average paler brown than those of *orienticola*. The range of *granti* consists of British Guiana northwest to the

northeastern part of the state of Bolivar in Venezuela (see above).

5. *Penelope jacquaçu speciosa* Todd, 1915, type locality, Rio Surutu, Provincia del Sara [Santa Cruz], Bolivia. *Speciosa* replaces nominate *jacquaçu* in central and eastern Bolivia and differs from it by averaging larger and by having a much better-developed crest, the feathers of the crest being very distinctly longer, narrower, more attenuated at the tip, and more conspicuously edged with grayish white than those of nominate *jacquaçu* or any other subspecies. The malar stripe of *speciosa* is not uniform as in nominate *jacquaçu*, but is variegated with grayish white as in *orienticola* and *granti*. The general coloration of the rest of the plumage is about the same in *speciosa* and nominate *jacquaçu*, although *speciosa* is usually somewhat darker above, and the pale edges of the feathers of its superciliary stripe are more conspicuous as a rule.

#### *Penelope obscura*

This species consists of three subspecies which show no evidence of intergradation and are or may be separated by gaps in distribution. Such a gap, consisting of a zone that is unsuitable ecologically, apparently isolates the ranges of *bridgesi* and nominate *obscura* in the Chaco, but the situation is not clear in the case of nominate *obscura* and *bronzina*.

*Penelope obscura bronzina* Hellmayr, 1914, type locality, Colonia Hansa, Santa Catarina, Brazil. This subspecies differs from nominate *obscura* by having the feathers of the crest and superciliary region conspicuously edged with grayish white, the pale edges of the feathers of the crest being very poorly indicated or obsolete in nominate *obscura* and lacking or virtually so on the superciliary feathers. *Bronzina* is also paler than nominate *obscura*, more bronzy-green above, less brown, less blackish on the head and neck, more olive on the breast, and more grayish brown, less rufescent on the abdomen. The range of *bronzina* is restricted to eastern Brazil from the states of Espirito Santo, Rio de Janeiro, and southeastern Minas Gerais, south through São Paulo and Parana to Santa Catarina.

*Penelope obscura obscura* Temminck, 1815, based on the "Yacuhu" of Azara (no. 335), Paraguay. This subspecies ranges from Paraguay south through northeastern Argentina (Misiones, Corrientes, and eastern Chaco to northern Santa Fe) to Uruguay east to extreme southeastern Brazil (Rio Grande do Sul).

*Penelope obscura bridgesi* G. R. Gray, 1860, type locality, "Bolivia," restricted here to Villa Montes, Tarija. This subspecies lacks the conspicuous superciliary streak of *bronzina*, but the pale edges on the feathers of the crest are well developed though somewhat less so than in *bronzina*. It is also bigger than the other two subspecies (tables 2 and 3), more rufous

(more chocolate brown), more uniform in coloration, especially below, and has purer white and more conspicuous edges on the scapulars and wing. Its range extends from central Bolivia (south of the range of *P. jacquacu speciosa*) south through northwestern Argentina in the subtropical zone of Jujuy, Salta, and Tucuman to neighboring Catamarca.

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### SPECIMENS EXAMINED

#### *Penelope purpurascens purpurascens*

MEXICO: *Tamaulipas*: Ciudad Victoria, 1 ♂, 1 ♀; Sierra Madre above Ciudad Victoria, 2 ♂, 3 ♀; Cañon Cavilleros, 1 ♂; Rio Sabinas near Gomez Farias, 1 ♀; Tampico, 1 ♂. *Veracruz*: Rivera, 75 miles south of Tampico, 1 ♂; Hacienda de los Atlixcos, 1 unsexed; Jalapa, 1 unsexed. *Oaxaca*: Tutla, 1 ♂, 2 ♀; Villa Alta, 1 ♀; Chimalapa, 1 unsexed. *Chiapas*: Catharina, Comitan, 1 ♂; Cerro Madre Vieja, Escuintla, 1 ♂, 1 ♀; 45 miles northwest of Arriaga, 1 ♀, 1 downy young. *Yucatan*: Yalahan, 2 ♀; northern Yucatan, no locality, 2 unsexed. *Sinaloa*: Arroyo de Lemones, 2 ♂, 5 ♀; Escuinapa, 1 ♂; Rio las Cañas, 12 miles north of Concha, 1 ♂, 2 ♀; Rancho Santa Barbara, 20 miles northeast of Rosario, 1 ♂. *Nayarit*: Rancho Papachula, Tepic, 1 ♂; Rio Santa Maria near Amatlan de Cañas, 1 ♀. *Jalisco*: Wakenakili Mountains, 1 ♀, 1 unsexed; Los Masos, 1 ♀.

GUATEMALA: Savana Grande, 1 unsexed; Cavallo Blanco, Retalhuleu, 1 ♂; Medio Monte [Pacific slope], 1 ♂; near Tiquisate, 4 ♂, 1 ♀; Finca Valle-Lirios,

Escuintla, 2 ♂; Concepcion del Mar, 1 ♂, 1 ♀; Capetillo, 1 unsexed; Volcan de Fuego, 1 ♀; Finca Sepacuite, Alta Vera Paz, 1 unsexed; Alta Vera Paz, no locality, 2 unsexed; Uspantan, Quiché, 1 ♂; Quebradas, Izabal, 1 ♀; Cerro San Gil, Rio Frio, Izabal, 1 unsexed; Los Amates, 4 ♂, 3 ♀; La Libertad, Peten, 1 unsexed; no locality, 1 unsexed.

BRITISH HONDURAS: Cockscomb Mountains, 1 ♂, 1 ♀; Manatee Lagoon, 1 ♂.

HONDURAS: La Ceiba, 3 ♂, 3 ♀; Lake Yojoa, 2 ♀; Cantoral, 2 ♂, 2 ♀; Alto Cantoral, 1 ♂; San Marcos de Guaycamas, 1 ♂; 6 miles up the Lily Branch of the Roman River, 1 ♀; no locality, 1 unsexed.

NICARAGUA: 45 miles up the Rio Escondido, 1 ♂, 1 ♀; San Emilio, Lake Nicaragua, 1 ♂, 1 ♀; Vizagua, 1 ♂, 1 ♀; Matagalpa, 2 ♀; Los Sabalos, San Juan River, 1 ♀; no locality, 1 unsexed.

*Penelope purpurascens aequatorialis*

COSTA RICA: Pozo de Terraba, 2 ♂, 1 ♀; Talamanca, 1 ♂; Miravalles, 1 ♂; Valza, 1 ♂, 1 ♀; Alajuela, Villa Quesada, 1 downy young; Cerro Santa Maria, Guanacaste, 1 ♂; Ballena, Guanacaste, 1 ♂; Bebedero, Guanacaste, 1 ♂; Las Cañas, 1 ♀; Orosi, Cartago, 1 ♀; Bonilla, 2 ♂; La Palma, 1 unsexed; Puerto Jimenez, Puntarenas, 1 ♀; no locality, 1 ♂.

PANAMA: Boqueron, Chiriqui, 1 ♂; Rio Cano, Valiente Peninsula, Bocas del Toro, 1 ♀; Changuena River, Bocas del Toro, 1 ♂; Crimacola, Bocas del Toro, 1 ♂; Wilcox Camp, San Lorenzo River, Veraguas, 1 ♀; east shore of Montijo Bay, 1 ♀, 1 unsexed; 10 miles east of Montijo Bay, 1 unsexed; Cerro Montosa, Cape Mala Peninsula, 1 ♂; Maxim's Ranch, 1 ♂; Lion Hill Station, 1 unsexed; Juan Avele, Rio Chiman, 1 ♀; Yartisa, Darien, 1 ♂, 1 ♀; Canglon, Rio Chucunaque, 1 ♀; Mt. Sapo, Darien, 1 ♂, 1 ♀; Cituro, Cupe River, Darien, 1 unsexed; Puerto Obaldia, 3 ♂, 1 ♀; Mt. Tacarcuna, 2 unsexed; east slope of Mt. Tacarcuna, 2 ♂, 2 ♀; no locality, 1 ♂.

COLOMBIA: *Choco*: Rio Salaqui, 1 ♂, 1 ♀; Rio Jurado, 1 ♂, 3 ♀; Rio Jamparado, 1 ♂; Alto del Buey, 3 ♂; no locality, 1 unsexed. *Bolivar*: El Porvenir, 1 ♂; Quimari, 2 ♂, 3 ♀; Cerro Murucucu, 3 ♂, 1 ♀; Tierra Alta, 3 ♂, 1 ♀; 4 miles north of Coloso, 1 ♀; Las Campanas, Coloso, 1 ♂; Santa Rosa, 15 miles west of Simiti, 1 ♀; Volador, 25 miles west of Simiti, 1 ♂; Regeneracion, lower Rio Cauca, 1 ♂; Socorre, upper Rio Sinu, 1 ♀; Catival, upper Rio San Jorge, 1 ♂, 1 ♀. *Magdalena*: Camp Costa Rica, 1 ♂. *Antioquia*: Nechi, 1 ♂; El Real, Rio Nechi, 1 ♂, 1 ♀; Villa Artiaga, 7 kilometers northeast of Pavarandocito, 1 ♂; Cuturu, 1 ♀. *Boyaca*: Florencia, Rio Cubujon, 1 ♂. *Arauca*: La Ceiba, Rio Cobaria, 2 ♀; Rio Arauca, 2 ♂, 1 downy young; Rio Bojaba, 2 ♂, 4 ♀. *Cundinamarca*: "Near Bogota," 1 unsexed. *Huila*: La Candela, 5 ♂, 3 ♀.

ECUADOR: Santo Domingo de los Colorados, 2 ♀; Balzar Mountains, 1 unsexed; Paramba, 2 ♂; Naranjo, 1 ♂, 2 ♀; Gualea, 1 ♂; El Chiral, 1 ♀; Nando, 1 ♀; Saloya, 1 ♂; Bajo Verde, 1 ♀.

VENEZUELA: San Antonio de Maturin, 2 unsexed; Guanoco, 1 ♂, 1 ♀; Cristobal Colon, Paria Peninsula, 2 ♂; Caracas, 1 unsexed.

*Penelope purpurascens brunnescens*

COLOMBIA: *Magdalena*: Santa Marta, 2 unsexed; Don Diego, 3 ♂, 4 ♀; Bonda,

2 unsexed; Minca, 1 ♂; Aguachica, 1 ♂, 1 ♀; Los Gorros, above Loma Larga, 2 ♂; Caracolcito, 2 ♀; La Cueva, 1 ♀; Camperucho, 1 ♀. *Guajira*: Carraipia, 1 ♂. *Norte de Santander*: Petrolea, 1 ♂.

VENEZUELA: Rio Cogollo, Perija, 1 ♀ (type of *brunnescens*); Guachi, 1 ♂; near the mouth of the Rio Guachi, 1 ♀; Las Quigas, 1 ♀; Montañas de Palmar, 1 ♂, 1 ♀; Montañas de Limones, 4 ♂; Capas, 1 unsexed.

*Penelope jacquaçu perspicax*

COLOMBIA: *Caldas*: Salento, 1 ♂, 1 ♀. *Valle*: Primavera, 1 ♂, 1 ♀; Rio Lima, near San Antonio, 1 ♀; Bitaco Valley, 2 ♂; Heights of Caldas, 2 ♂. *Cauca*: San Antonio, 1 ♂, 1 ♀; Palmira, 1 ♂; Lomitas, 1 ♂; Charguayaco, 1 ♀; Rio Mechengué, 1 ♀; Munchique, 1 ♂, 1 ♀; Clementina (not located), 1 ♂.

*Penelope jacquaçu jacquaçu*

COLOMBIA: *Meta*: Villavicencio, 1 ♂; Rio Guapaya, La Macarena, 2 ♂; Los Micos, San Juan de Arama, 2 ♂, 2 ♀; *Caquetá*: Morelia, 1 ♂, 2 ♀; Rio Mecaya, 1 ♂, 1 unsexed; Florencia, 2 ♂, 1 unsexed. *Putumayo*: Puerto Umbria, 2 ♂, 1 unsexed.

ECUADOR: San José de Sumaco, 1 ♂, 1 ♀; Rio Juno, 1 ♂, 1 ♀; Sarayacu, 1 ♂, 1 ♀, 1 unsexed; Montes del Suno, 2 ♂, 1 ♀; Rio Sinu above Avila, 3 ♂, 1 ♀; Lagarto Yacu, 1 ♂; Raya Chigta, Loreto, 1 ♂, 1 ♀; Ouca Yacu, Loreto, 2 ♂; Rio Guataraco, Loreto, 1 ♂.

PERU: Along the Rio Curaray, 1 ♂; Boca del Rio Curaray, 4 ♂, 2 ♀; Puerto Yesup, Junin, 2 ♂; Moyobamba, San Martin, 1 ♂; Rio Jelashte, San Martin, 1 ♂; Hacienda Cadena, Marcapata, 3 ♂, 1 ♀; Calleria, Quebrada del Ucayali, 2 ♂; Yurimaguas, 2 ♂, 1 ♀; Iquitos, 1 ♀; lower Napo River, 1 unsexed; Chanchamayo, 20 kilometers east of La Merced, 3 ♂, 5 ♀, 1 nestling; Vista Alegre, Huanuco, 1 ♀; Boca del Rio Urubamba, 4 ♂, 2 ♀; Puerto Indiana, Rio Amazonas, 1 ♂, 2 ♀; Sarayacu, Rio Ucayali, 5 ♂, 1 ♀; Rio Comerciato, 1 ♂, 1 ♀; Rio Negro, about 35 miles west of Moyobamba, 1 ♂; Pisana, 2 unsexed; Pozuzo, 2 ♀; Huarandosa, valley of the Rio Chinchipe, 1 ♂; Collpa, Rio Tambopata, Madre de Dios, 1 ♂, 1 ♀.

BOLIVIA: Lower Rio Beni, 1 unsexed.

BRAZIL: Boca del Lago, Tefé, 3 ♂, 3 ♀; Santo Antonio, Rio Eiru, Rio Jurua, 2 ♀; Labrea, Rio Purus, 1 ♂; Catunama, 2 ♂, 1 ♀; Hyutanaha, 1 ♂; Jamarysinho, Rio Machados at the confluence with the Rio Madeira, 2 ♂; Humaytha, Rio Madeira, 1 ♂, 2 ♀; Rosarinho, Lago Sampaio, Rio Madeira 2 ♂, 3 ♀; Porto Velho, Rio Madeira, 1 ♂; Alliança, Rio Madeira, 1 ♀; San Carlos, Mato Grosso, 1 unsexed; Lago Manaqueri, 1 unsexed.

*Penelope jacquaçu orienticola*<sup>1</sup>

BRAZIL: Manacapuru, Rio Solimões, 1 ♂ (type of *orienticola*); Tahuapunto, Rio Uaupes, 2 ♂; Tabocal, Rio Negro, 3 ♂, 1 ♀; Yucahy, Rio Negro, 1 ♀; Mirapinima, Rio Negro, 1 ♂; Yavanari, Rio Negro, 1 ♂; Tatu, Rio Negro, 1 ♂; Mt. Curucuryari, Rio Negro, 1 ♂; Igarapé Cacao Pereira, Rio Negro, 1 ♂.

<sup>1</sup> Specimens intermediate between *orienticola* and *granti* are included.

VENEZUELA: Junction of the Rio Cassiquiare and Rio Huaynia, 1 ♂, 1 ♀; Solano, Rio Cassiquiare, 2 ♂, 1 ♀; El Merey, Rio Cassiquiare, 2 ♂; opposite El Merey, Rio Cassiquiare, 2 ♂; Mt. Duida, 1 ♂; Caño Leon, Mt. Duida, 2 ♂, 1 ♀; Esmeralda, Mt. Duida, 1 ♂, 1 ♀; Mt. Auyan-tepui, 4 ♂, 2 ♀, 2 unsexed; Arabupu, Mt. Roraima, 4 ♀, 1 unsexed; La Prision, Rio Caura, 1 ♀.

*Penelope jacquaçu granti*

VENEZUELA: Caño Antabari, Raudal Capuri, Rio Paragua, 1 ♂.

BRITISH GUIANA: Kartabo, 1 ♂; near Kartabo, 1 ♂; Kalacuru, 1 ♂, 1 ♀; Aunai, 1 ♀; Rockstone, Essequibo River, 2 ♂, 3 ♀; Oko Mountains, 1 ♂, 1 ♀; Wismar, Demerara River, 1 ♂; Demerara River, 1 unsexed; Takutu River, 1 ♂ (type of *granti*).

*Penelope jacquaçu speciosa*

BOLIVIA: Rio Surutu, Santa Cruz, 2 ♂, 2 ♀, 1 unsexed (type of *speciosa*); Rio Yapacani, Santa Cruz, 1 ♂, 2 unsexed; Rio Ichilo, Santa Cruz, 1 ♂; Susi, Rio Beni, 1 ♀; Buena Vista, Santa Cruz, 11 ♂, 8 ♀, 3 unsexed; Camp Wood, Province of Sara [=Santa Cruz], 1 ♀; high woods of the Province of Sara, 1 ♀; Mission San Antonio, Rio Chimoré, Cochabamba, 2 ♂; Todos Santos, Rio Chaparé, 2 ♂; Esperanza [not located], 1 ♂; no locality, 1 unsexed.

*Penelope obscura bronzinga*

BRAZIL: *Espirito Santo*: Santa Barbara do Caparão, 1 ♀. *Rio de Janeiro*: Serra do Itatiaya, 1 ♀; Rio de Janeiro, 1 ♂, 1 ♀, 1 unsexed. *Minas Gerais*: Estação do Tunnel, 2 ♀. *São Paulo*: Piquete, 1 ♀; no locality, 1 unsexed. *Parana*: Fazenda Morungava, Jaguariahya, 2 ♂, 2 ♀; Roca Nova, 1 ♂. *Santa Catarina*: Jaragua, 1 ♂.

*Penelope obscura obscura*

BRAZIL: *Rio Grande do Sul*: São Francisco de Paula, 1 ♂.

PARAGUAY: No locality, 1 unsexed.

URUGUAY: Mansavillagra, Rio Yi, Florida, 1 ♀; Tres Cruces Grande, Artigas, 1 ♀; near Paysandu, 1 unsexed; no locality, 1 ♂.

ARGENTINA: Mocovi, Santa Fe, 1 ♂, 1 ♀.

*Penelope obscura bridgesi*

BOLIVIA: *Cochabamba*: Tin Tin, 2 ♂, 1 ♀; road between Comarapa and Totora, 1 ♂. *Santa Cruz*: Comarapa, 1 ♂; Lagunillas, 2 ♂; Samaipata, 2 ♂; Pulquina, 1 ♂; California, 1 ♀. *Chuquisaca*: Rio Azuero, 1 ♀. *Tarija*: Rio Lipeo, 1 ♂, 2 ♀; Melocoton, 1 ♂; Villa Montes, 1 ♀; no locality, 1 unsexed (type of *bridgesi*).

ARGENTINA: *Jujuy*: Santa Barbara, 2 ♂. *Salta*: Salta, 1 ♀. *Tucuman*: Sierra de Vipos, 3 ♂, 1 ♀; Villa Mongdo, San Pablo, 1 ♂; Villa Nouges, 1 ♂; Tafi, 1 ♂, 1 ♀; Norco, 1 ♀.

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