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GEOGRAPHICAL VARIATION IN *BELONOPTERUS*
CHILENSIS (MOLINA)

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Belonopterus is a common bird in most parts of South America. It is found everywhere on the continent, except in Ecuador, Peru, and western Bolivia. It is difficult to see why such an adaptable form, able to adjust itself to the diverse environments of sea level at the Equator, rather high elevations in the Andes, and the harsh conditions of the Straits of Magellan, its range including both the humid tropics and cold deserts, has not been able to become established in the central Pacific area.

In adaptability to environmental conditions, abundance, and wide distribution, as well as in its noisy habits, this plover seems to suggest on the southern continent *Oxyechus vociferus* of North America.

Critical examination of a series of more than 200 specimens of *Belonopterus chilensis* shows that the species is divisible into at least four geographic races, instead of the three currently recognized. In addition to the material at Ann Arbor, I have been able to study skins from most of the principal collections in the country. It is a pleasure to acknowledge the kindness in this respect of Mr. H. B. Conover and of the authorities of the Academy of Natural Sciences of Philadelphia,

the American Museum of Natural History, Carnegie Museum, Field Museum of Natural History, the Museum of Comparative Zoology, and the United States National Museum. I am also grateful to M. Janusz Domaniewski, who very kindly examined for me in Warsaw the type of *Belonopterus cayennensis intermedius* Sztolcman.

The forms recognized, together with their respective characters and ranges, are listed below.

Belonopterus chilensis cayennensis (Gmelin)

[Parra] *cayennensis* Gmelin, Syst. Nat., I, pt. ii, 1789: 706; "Cayenne."

CHARACTERS.—Head and sides of neck Light Drab,¹ somewhat paler on foreneck; black line on throat narrow and not reaching the breast;² black of breast restricted in area, with a dark blue, sometimes almost purplish, sheen; nuchal crest long and black; white tip of tail restricted, the black subterminal band wide; tibia unfeathered for about half its length; tarsus the longest of any race.

MEASUREMENTS (in mm.).—Adult males:³ wing (flat), 223–244 (233.9); tail, 95–108 (99.6); black tail band,⁴ 45–52 (48.9); tarsus, 73–87.5 (80.5); exposed culmen, 28.5–32 (30.2).

Adult females:⁵ wing, 222–240 (230.2); tail, 91.5–112 (99.7); black tail band, 43–52 (45.0); tarsus, 73.5–84 (79.2); exposed culmen, 27.5–32.5 (29.5).

RANGE.—Colombia, west to the Atrato and Cauca valleys and south to Cauca (Cali), Tolima (Salento), Cundinamarca,

¹ Colors in capitals are from R. Ridgway, *Color Standards and Color Nomenclature*, Washington: published by the author, 1912. Pp. 44, 53 color plates.

² Alfred Laubmann ("Vögel," *Wiss. Ergebn. Deutsch. Gran Chaco-Exped.*, Stuttgart: Strecker and Schröder, 1930: 60, footnote 3) mentions a bird from Caura, Venezuela, in which the line reaches the breast, though reduced in width.

³ Twenty-three specimens from Colombia, Venezuela, and British Guiana.

⁴ The greatest amount of black, measured from above along the shaft of the middle rectrices.

⁵ Eighteen specimens from Colombia, Venezuela, and British Guiana.

and the Rio Meta (Barrigona); thence through Venezuela and the Guianas to northern Brazil, where it intergrades with *lampronotus* along the Amazon.

REMARKS.—Birds from Colombia have longer wings and shorter tarsi than do specimens from Venezuela and British Guiana. There is considerable overlapping in measurements, and therefore in the absence of any color difference, it is best to consider them all under the same name.

Pará skins are intermediate between *cayennensis* and *lampronotus*, some specimens having the black throat line continuous from chin to breast, while others taken at the same time and place have the line confined to the region of the upper neck. Indeed, Laubmann⁶ has identified two skins in the Munich Museum from the Island of Marajó as *lampronotus*. While Amazonian birds exhibit some slight peculiarities in size also, and examination of longer series may perhaps show that they are worthy of separation by name, still in sum total of characters they are closer to *cayennensis* than to *lampronotus*, and I think it well to refer them all to the former race.

MATERIAL EXAMINED.—Sixty-nine specimens from localities as follows.

Brazil: Pará (Boa Vista, 3; Caviana Island, 2; Diamantina, 2; Maraba, Rio Tocantins, 1; Obidos, 6; Rio Maycuru, Monte Alegre District, 2; Santarem, 2.

British Guiana: Annai, 2; Demerara, 2.

Colombia: Antioquia (Medellin, 1; Puerto Berrio, 1); Cauca (Cali, 6; not further specified, 1); Choco (Rio Atrato, 2); Cundinamarca ("Bogotá," 2; El Roble, 1); Meta (Barrigona, 3); Santa Marta (Aracataca, 1); Tolima (Salento, 2); Valle del Cauca (Atuncela, 1; Las Lomitas, 2; Oaldas, 1; Palmira, 2; Quabinas, 1; San Antonio, 2); place not specified, 3.

Venezuela: Bolivar (Caicara, 3; Maripa, 3); Delta (Sacupana, 2); Mérida (Mérida, 1); Monagas (La Padrita, Rio de Uracoa, 4); Zulia (Catatumbo, 1; Perija, 1).

⁶ *Loc. cit.*: 60.

TABLE I
BELONOPTERUS CHILENSIS CAYENNENSIS

ADULT MALES	WING			TARSUS		
	Min.	Max.	Av.	Min.	Max.	Av.
Colombia (13)	227	244	236.8	73	86	79.2
Venezuela and British Guiana (10)	223	236	230.1	77.5	85	82.3
Pará (9)	220	235	227.7	75.5	83.5	79.6
ADULT FEMALES						
Colombia (9)	226	240	232.2	73.5	82	78.2
Venezuela and British Guiana (9)	222	236	228.3	77	86	81.3
Pará (8)	218	230	224.3	74	80	76.8

Belonopterus chilensis lampronotus (Wagler)

Ch[aradrius] Lampronotus Wagler, Syst. Av., pt. 1, 1827: [74], sp. 48, part; "Habitat in Paraguayae, Brasiliae, Cajennae."

Belonopterus cayennensis intermedius Sztolerman, Ann. Zool. Mus. Polon. Hist. Nat., V, no. 4, Dec. 31, 1926: 203; "Brésil."

CHARACTERS.—Similar to *Belonopterus chilensis cayennensis*, but head and sides of neck averaging grayer, Drab Gray, Light Drab, or Smoke Gray; black line on foreneck broader and reaching the breast; black tail band narrower; tarsus shorter; culmen somewhat longer.

MEASUREMENTS.—Adult males:⁷ wing, 217–246 (232.0); tail, 92–110.5 (101.5); black tail band, 35–51 (42.7); tarsus, 69–83.5 (74.6); exposed culmen, 28.5–34 (31.1).

Adult females:⁷ wing, 216–246 (230.1); tail, 89–107.5 (99.8); black tail band, 31–53 (41.7); tarsus, 67–81.5 (74.0); exposed culmen, 29–34.5 (31.1).

RANGE.—Brazil south of the Amazon, through Paraguay, Uruguay, and the Bolivian Chaco, to northern Argentina, intergrading with *chilensis* in Tucumán and probably south-

⁷ Forty-one specimens from eastern Brazil to northern Argentina.

ern Buenos Aires. Some winter birds from Buenos Aires Province approach *chilensis*.

REMARKS.—Wetmore⁸ has suggested that there might be a significant difference in the width of the black line down the foreneck in birds from Paraguay and southern Brazil as compared with Argentine skins. While there is considerable variation in this respect in my series, I am not able to see that it is geographic rather than individual.

Wetmore's action⁹ in restricting the type locality of *Charadrius lampronotus* Wagler to Paraguay was unnecessary, for Peters¹⁰ had preceded him in restricting it to southern Brazil. Hellmayr¹¹ has pointed out that the only specimen remaining in the Munich Museum since the time of Wagler is from Brazil and is of the southern race, but according to Laubmann,¹² the type is no longer in Munich.

Sztoleman's description of *Belonopterus cayennensis intermedius* is so brief that one is left in doubt as to what form is meant, and the locality given, simply "Brésil," does not help to settle the question. At my request M. Janusz Domaniewski has examined the type in the Warsaw Museum, and he writes that the black line on the throat continues uninterrupted from the chin to the breast. The following measurements of the type, which does not have the sex recorded, were taken by him in the same manner as the measurements used in this paper: wing, 224 mm.; tail, 98; extent of the black subterminal band of the tail, 42; tarsus, 70. The bill, being damaged, was not measured. It thus appears that the type belongs to the race *lampronotus* rather than *cayennensis*, and I therefore restrict the type locality of *Belonopterus cayennensis intermedius* Sztoleman to Brazil south of the Amazon River.

⁸ "Observations on the birds of Argentina, Paraguay, Uruguay, and Chile," *Bull. U. S. Nat. Mus.*, No. 133, 1926: 171.

⁹ *Ibid.*: 170.

¹⁰ "Notes on some summer birds of northern Patagonia," *Bull. Mus. Comp. Zool.*, 65, no. 9, May 1923: 296, footnote 1.

¹¹ "A contribution to the ornithology of northeastern Brazil," *Field Mus. Nat. Hist. Pub., Zool. ser.*, 12, March 1929: 491, footnote 1.

¹² *Op. cit.*: 61, footnote 1.

Examination of more ample eastern Brazilian material will probably show the presence of an unrecognized subspecies in that region, to which Sztolcman's name may or may not be applicable.

MATERIAL EXAMINED.—Ninety-three specimens from the following localities.

Argentina: Buenos Aires (Cambaceres, June 22, 2 [not typical]; Carhue, 1; Chascomus, 1; Conchitas, 4; Gral Lavalle, 2; La Plata, 1; Mar del Plata, 15; Quilmes, 2 [1 June skin not typical]; Yaacka Mar, 1; not further specified, 2 [1 not typical]); Entre Rios (Concepcion del Uruguay, 2 [1 not typical]); Misiones (Santa Ana, 2); Santa Fé (Bovril Island, 2; Rio Salado near Las Palmares, 1); Tucumán (Concepcion, 2 [not typical]; Tafi del Valle, 2 [not typical]).

Bolivia: El Oriente (Puerto Suarez, 1); Santa Cruz (Buenavista, 4; Santa Cruz, 3).

Brazil: Bahia (Barra, 2; Cidade da Barra, Rio San Francisco, 1); Maranhão (Ilha São Luiz, Estiva, 3; Miritiba, 2); Matto Grosso (Aquidaurana, 2; Arapuá, 2; Conceição, 1; Cuyaba, 1; Sant' Anna do Paranahyba, 1); Parahyba (Santa Luzia, 1); Pernambuco (Petrolina, 1); Piauhy (Bello Horizonte, 2; Floriano, 1; Parahyba Delta, 1; Urussuhy, 1); Rio Grande do Sul (Cacequy, 3); "Brazil," 3.

Paraguay: Fort Wheeler, Chaco, 1; Horqueta, 5; Puerto Pinasco, 1; Sapucay, 2; Villarica, 2; not further specified, 1.

Uruguay: Lazcano, Rocha, 1; Quebrachio, 1; Rincón de Tejera, Canelones, 1; Treinta y Tres, 1.

Belonopterus chilensis chilensis (Molina)

Parra chilensis Molina, Saggio Stor. Nat. Chili, 1782: 258, 344; Chili.

Vanellus occidentalis Harting, P. Z. S. Lond., 1874: 450; "Chili, Patagonia, Falkland I. (?)."

Vanellus griseescens Prazak, Orn. Monatsber., IV, no. 2, Feb. 1896: 23; "Nord Chili."

CHARACTERS.—Similar to *Belonopterus chilensis lampronotus*, but head and sides of neck Pale Neutral Gray; nuchal crest short and grayish; black of breast more extensive, and

showing green reflections; black line on foreneck still broader; white tip of tail, as well as black subterminal band, larger; tibia bare for only one-third its length; wing and tail longer; tarsus shorter.

MEASUREMENTS.—Adult males:¹³ wing, 254–263 (258.9); tail, 114–130 (121.2); black tail band, 42–55 (47.0); tarsus, 68–78 (72.7); exposed culmen, 26.5–31.5 (29.5).

Adult females:¹⁴ wing, 245–261 (251.6); tail, 112–127.5 (116.0); black tail band, 43–51.5 (46.2); tarsus, 64.5–77 (71.2); exposed culmen, 26–32.5 (29.8).

RANGE.—Chile, from Antofagasta (San Pedro), south to Llanquihue, where it intergrades to the next form; northern Patagonia, from Rio Negro and Mendoza to Chubut (Valle del Lago Blanco).

Apparently the sole basis for including Peru in the range of this bird is Taczanowski's *Ornithologie du Pérou*,¹⁵ where it is stated that there is a specimen from the "côte péruvienne (coll. Raimondi)." This seems to me to be too scanty evidence to warrant inclusion of Peru in the range of this species, especially since the boundary between Peru and Chile was far from stationary in Raimondi's time.

REMARKS.—Some authors, notably Harting,¹⁶ P. R. Lowe,¹⁷ Hellmayr,¹⁸ and Laubmann,¹⁹ refuse to accept *Parra chilensis* as the name for this species on the ground that it is a *mixtum compositum* of the lapwing and *Jacana jacana*. Many names having a composite basis are in use, however, and as Peters²⁰ and Wetmore²¹ have pointed out, most of Molina's description and all of his account of the habits pertain to *Belonopterus*.

¹³ Fourteen specimens.

¹⁴ Eleven specimens.

¹⁵ *Orn. Pérou*, Rennes: Oberthur, 3, 1886: 336.

¹⁶ "On the lapwing of Chili," *P. Z. S. Lond.*, 1874: 450.

¹⁷ *Bull. Brit. Orn. Cl.*, 41, 1921: 110.

¹⁸ "The birds of Chile," *Field Mus. Nat. Hist. Pub., Zool. ser.*, 19, 1932: 367.

¹⁹ *Op. cit.*: 59, footnote 4.

²⁰ *Op. cit.*: 295.

²¹ *Op. cit.*: 168.

TABLE II
BELONOPTERUS CHILENSIS LAMPRONOTUS

ADULT MALES	WING			TAIL			BLACK TAIL BAND		
	Min.	Max.	Av.	Min.	Max.	Av.	Min.	Max.	Av.
Eastern Brazil (Maranhão, Piahy, Parahyba, Pernambuco, and Bahia) (7)	217	237	223.8	92	101.5	95.7	40	47	45.5
Southern Brazil (southern Matto Grosso and Rio Grande do Sul), eastern Bolivia, Paraguay, and Uruguay (15)	223	239	232.8	92	105	100.1	40	51	43.5
Northern Argentina (Buenos Aires, Entre Rios, Misiones, and Santa Fé) (19)	225	246	235.2	99	110.5	104.6	35	50	41.1
ADULT FEMALES									
Eastern Brazil (8)	216	235.5	222.2	89	101.5	96.3	39	53	46.4
Southern Brazil, eastern Bolivia, Paraguay, and Uruguay (17)	222	240	230.4	93.5	105.5	99.4	31	50	41.6
Northern Argentina (16)	225.5	243	233.3	89.5	107.5	101.9	35	45	39.7

TABLE II (Continued)
BELONOPTERUS CHILENSIS LAMPRONOTUS

	TARSUS			EXPOSED CULMEN		
	Min.	Max.	Av.	Min.	Max.	Av.
ADULT MALES						
Eastern Brazil (Maranhão, Piauí, Parahyba, Pernambuco, and Bahia) (7)	69	82	74.8	29	31.5	30.3
Southern Brazil (southern Mato Grosso and Rio Grande do Sul), eastern Bolivia, Paraguay, and Uruguay (15)	71	83.5	77.8	28.5	33.5	31.3
Northern Argentina (Buenos Aires, Entre Ríos, Misiones, and Santa Fé) (19)	69	77.5	72.1	29	34	31.4
ADULT FEMALES						
Eastern Brazil (8)	70	81.5	73.9	29	32	30.2
Southern Brazil, eastern Bolivia, Paraguay, and Uruguay (17)	69	79.5	75.6	29	34.5	31.4
Northern Argentina (16)	67	76.5	72.4	29	34	31.4

The jacana, moreover, is only of accidental occurrence in Chile, and so I use Molina's name for the lapwing. The type locality of *Parra chilensis* Molina is here restricted to the Province of Maule, Chile, of which Molina was a resident.

Two apparent co-types of Harting's *Vanellus occidentalis* in the United States National Museum (Nos. 107085 and 107086) have been examined in the present connection. They belong to the form inhabiting northern Chile and Patagonia and are labeled simply "Chile." At least one other co-type is in the British Museum.²² Since Harting received his birds from Edwyn C. Reed, I hereby restrict the type locality of *Vanellus occidentalis* Harting to Cauquenes, Province of Colchagua, Chile, a locality where Reed is known to have found this species.

By application of Article 25a of the International Rules of Zoological Nomenclature, *Belonopterus cayennensis molina* Lowe²³ is a *nomen nudum*, for although a type specimen and a vernacular name are designated, there is no indication, definition, or description.

Birds from the two sides of the Andes seem to be identical in both coloration and size, and they apparently can intermingle in the many places where the high mountains break down in the south.

MATERIAL EXAMINED.—Thirty specimens from the following localities.

Argentina: Chubut (Valle del Lago Blanco, 1); Mendoza (Mendoza, 3; Tunuyan, 4); Rio Negro (Huanuluan, 3; Maquinchao, 1).

Chile: Atacama (Vallenar, 3); Cautin (Temuco, 1); Concepcion (Concepcion, 1); Coquimbo (Cruz Grande, 1); Llanquihue (Ancud, 1; Pumalin, 1 [not typical]); Malleco (Angol, 3; Curacautin, 1); "Porvenir," 1; "Chile," 5.

²² Sharpe, *Cat. Birds Brit. Mus.*, 24, 1896: 735.

²³ *Belonopterus cayennensis molina* P. R. Lowe, *Bull. Brit. Orn. Cl.*, 41, no. 259, April 27, 1921: 111; "Taleakuana, [sic] South Chile" = Talcahuano, Prov. Concepcion.

TABLE III
BELONOPTERUS CHILENSIS CHILENSIS

ADULT MALES	WING			TAIL			TARSUS		
	Min.	Max.	Av.	Min.	Max.	Av.	Min.	Max.	Av.
Chile (9)	257	262.5	259.4	115.5	122	119.2	69.5	78	73.4
Northern Patagonia (5)	254	263	258.2	114	130	123.6	68	75	71.0
ADULT FEMALES									
Chile (5)	245	261	253.2	112	127.5	117.9	70.5	77	73.2
Northern Patagonia (6)	247	259	250.0	112	122	114.8	64.5	72.5	69.5

***Belonopterus chilensis fretensis*, subsp. nov.**

DESCRIPTION OF TYPE.—University of Michigan Museum of Zoology, No. 63899; ♀; Cheaike, Rio Chico, Magellanes, Chile; 16 January, 1898; A. E. Colburn; original number, 215.

Forehead, fore part of lores, chin, a stripe down the fore-neck 10–15 mm. broad, and entire breast black with a metallic green gloss; fore part of crown white, this color passing down over central portion of lores and anterior portion of malar region to form a border along the black neck stripe; posterior portion of crown, occiput, nape (including a nuchal crest about 40 mm. in length), hindneck, posterior portion of malar region, auriculars, and sides of neck Pale Neutral Gray, somewhat darker on the occiput; a dusky mark along the front and upper margins of eye; lower eyelid white; bastard wing, primary coverts, and primaries black; first (outermost) secondary black, with a white spot on inner web at base, and at extreme base of outer web; succeeding secondaries with more white and less black, until the tenth is wholly white on the outer web (except for a narrow black shaft streak), and the black end spot of the inner web is only 60 mm. long, with a small white spot at the extreme tip; outer web of eleventh secondary Pale Drab Gray bordered with white, the inner web being white with a somewhat smaller black subterminal patch; outermost tertial Pale Drab Gray, bordered with white, and with a black marginal spot near the tip of the inner web; next tertial entirely Pale Drab Gray; third tertial oily Tea Green; scapulars oily Tea Green, the outer ones iridescent with coppery violet; lesser coverts iridescent green, passing into purplish copper toward base; middle coverts Pale Neutral Gray, the outer ones more or less white-tipped; greater coverts white, the inner ones becoming Pale Neutral Gray basally; upper back oily Light Grayish Olive; rump Light Neutral Gray; upper tail coverts, belly, flanks, thighs, crissum, under wing coverts, and axillaries white; tail white, with a black subterminal band 22 mm. in width on the outer rectrices to 44 mm. in width on the central ones, the white tip varying from

12-8 mm. in width in the same order; bill (in dried skin) flesh at base, black terminally; wing-spur orange; tibia flesh; tarsus, toes, and claws dark brown.

Wing, 231; tail, 105; tarsus, 57; exposed culmen, 28; culmen from base, 36 mm.

CHARACTERS.—Similar to *Belonopterus chilensis chilensis* in coloration, but decidedly smaller, especially the tarsus.

MEASUREMENTS.—Adult males:²⁴ wing, 239-252 (246.8); tail, 109-122.5 (114.2); black tail band, 39-43 (41.1); tarsus, 63-66.5 (65.5); exposed culmen, 29-31 (30.2).

Adult females:²⁵ wing, 231-250 (242.2); tail, 105-117 (112.7); black tail band, 43-47 (44.2); tarsus, 57-63 (61.5); exposed culmen, 28-29.3 (28.4).

RANGE.—Santa Cruz Territory and Magellanes, north to Chubut (Lago Mosquitos, Cholila) and southern Llanquihue (Rio Ñirehuau); in winter north to Chiloé Island (Ancud).

MATERIAL EXAMINED.—Fourteen specimens from the following localities:

Argentina: Santa Cruz (Gallegos, 1; Palaike, 1; near Rio Coy, 1).

Chile: Llanquihue (Ancud, 1; Casa de Richards, Rio Ñirehuau, 1); Magellanes (Cheaike, 2; Elizabeth Island, 1; Gregory Bay 2; Punta Arenas, 4).

²⁴ Seven specimens, including one measured by Wetmore (*Univ. Calif. Pub. Zool.*, 24, no. 4, April, 1926: 429).

²⁵ Five specimens.

