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Source: Bulletin of the British Ornithologists' Club, 142(3): 323-328

Published By: British Ornithologists' Club

URL: https://doi.org/10.25226/bboc.v142i3.2022.a5

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On the sympatric occurrence of two subspecies of Blue-crowned Manakin, *Lepidothrix coronata exquisita* and *L. c. caelestipileata*, in south-west Amazonia

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Received 6 January 2022; revised 21 March 2022; published 6 September 2022

http://zoobank.org/urn:lsid:zoobank.org:pub:87B3260B-896E-474C-ACE3-50FE946A9386

SUMMARY.—I present evidence of sympatric occurrence of two subspecies of Bluecrowned Manakin *Lepidothrix coronata* in south-west Amazonia. Specimens collected in eastern Acre in Brazil and northern Bolivia, as well as records from south-east Peru, indicate that *L. c. exquisita* and *L c. caelestipileata* both occur in the south-east of the Inambari centre of endemism, when compared to their respective holotypes. Thus, *L. c. exquisita*, which was considered endemic to central-north Peru, is also present in the lowlands of south-west Brazilian Amazonia and northern Bolivia, whilst *caelestipileata*, previously known from the Juruá–Madeira region in Brazil, is present further south, reaching south-east Peru and northern Bolivia.

Blue-crowned Manakin *Lepidothrix coronata* is a widely distributed frugivorous passerine. It ranges from southern Central America (Costa Rica and Panama) to northwestern South America south to northern Ecuador, and across western Amazonia from southern Venezuela and south-east Colombia to Peru and Bolivia (Kirwan & Green 2012). Males possess two plumage patterns. In some populations males are black and in others they are predominantly green. Both black and green males have a blue crown. Females and juveniles are uniform green. Amazonian populations are divided into the *coronata* group (black males) including *L. c. coronata, L. c. carbonata* and *L. c. caquetae*, and the *exquisita* group (with green males) comprising *L. c. exquisita, L. c. caelestipileata* and *L. c. regalis* (Kirwan & Green 2012). The *exquisita* group is restricted to south-west Amazonia in the Inambari centre of endemism (Cracraft 1985, Silva *et al.* 2005), with *L. c. exquisita* considered endemic to Peru, *L. c. regalis* endemic to Bolivia, and *L. c. caelestipileata* restricted to south-east Peru and adjacent Acre and Amazonas states in Brazil (Kirwan & Green 2012). Here, I present evidence of the presence of *L. c. exquisita* in Brazil and Bolivia, in sympatry with *caelestipileata* in this part of south-west Amazonia.

To obtain historical records of the distribution of three subspecies of *L. coronata* in southwest Amazonia (Fig. 1), I consulted VertNet (http://www.vertnet.org; accessed 15 December 2021) and GBIF (https://doi.org/10.15468/dl.evws4u; accessed 28 December 2021), as well as specimens in the Museu Paraense Emílio Goeldi (MPEG), Belém. Photos of the holotypes of *L. c. exquisita* (AMNH 493004) and *L. c. caelestipileata* (NMBE 1006262) were provided by the American Museum of Natural History, New York, and Naturhistorisches Museum Bern, respectively (Fig. 2). A photo of an *L. c. caelestipileata* (MZUSP 35743) collected in Acre in 1951 was provided by the Museu de Zoologia da Universidade de São Paulo (MZUSP) (Fig. 3C). I took photos of specimens at MPEG in Belém (Fig. 3A–B) and I was later sent additional photos of these individuals by the museum's curators (Fig. 4).

The compilation of records indicated the occurrence of *L. c. coronata* on the south bank of the Solimões and left bank of the Juruá in the west of the Inambari centre of endemism (see Cracraft 1985; Fig. 1). On the upper Juruá, this subspecies reaches the right bank and extends across central-west Acre (Fig. 1). *L. c. caelestipileata* is present throughout the

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324

Figure 1. Distribution of three subspecies of Blue-crowned Manakin Lepidothrix coronata in south-west Amazonia. The rectangle indicates the region where the taxa *exquisita/caelestipileata* occur in sympatry.

Madeira-Juruá interfluvium in the state of Amazonas (Brazil) extending to the border region between Brazil, Bolivia and Peru, south of the Inambari (Fig. 1). L. c. exquisita occurs in the Andean foothills of northern Peru to the Amazon lowlands of Peru, Brazil and Bolivia (Fig. 1). In eastern Acre, Brazil, in dpto. Pando in Bolivia and dpto. Madre de Dios in Peru *L. c. exquisita* and *L. c. caelestipileata* occur in sympatry (Fig. 1).

Identification of specimens in the area of sympatry between *exquisita* and *caelestipileata* was confirmed by comparison with their relevant holotypes (Fig. 2). Four specimens from Acre and one from Bolivia (Figs. 3A-B and 4; Table 1) have the crown paler blue and correspond to exquisita (Figs. 2B and 4), whereas another collected in the same part of Acre (Fig. 3C; Table 1; Pinto & Camargo 1954) has the brighter blue crown indicative of caelestipileata (Figs. 2D and 4; Pinto & Camargo 1954). The straight-line distance between the closest localities of exquisita and caelestipileata in Acre is only 50 km (Fig. 1). In addition, a specimen at the Museum of Vertebrate Zoology, Berkeley, CA, from dpto. Madre de Dios, Peru, is assigned to *caelestipileata* (Table 1), extending the distribution of this subspecies to the southern boundary of the Inambari (Fig. 1).

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(Online)



325

Figure 2. Holotypes of two subspecies of Blue-crowned Manakin *Lepidothrix coronata*. (A–B) *L. c. exquisita* (Hellmayr 1905) (Paul Sweet, © American Museum of Natural History, New York); (C–D) *L. c. caelestipileata* (Goeldi 1905) (Manuel Schweizer, © Naturhistorisches Museum Bern). Note the difference in the blue crown: pale turquoise in *exquisita* and darker and shinier in *caelestipileata*.



Figure 3. Evidence of sympatric occurrence among two geographic races of Blue-crowned Manakin in south-west Amazonia. (A) *L. c. exquisita*, eastern Acre, Brazil (MPEG 63656) (Edson Guilherme); (B) *L. c. exquisita*, dpto. Pando, northern Bolivia (MPEG 54188) (Edson Guilherme); and (C) *L. c. caelestipileata*, eastern Acre, Brazil (MZUSP 35743) (Luís Fábio Silveira, © Museu de Zoologia da Universidade de São Paulo). Note the difference in crown colour between the specimen of *caelestipileata* (C) versus those of *exquisita* (A–B).

Hellmayr (1905) described *exquisita* as having the 'crown of the head beautiful sky blue' and Goeldi (1905) described *caelestipileata* in German as having the crown 'Himmelblauen' (sky blue), but there is a difference between the blue of *exquisita* (turquoise/lighter; Figs. 2A–B and 4) and that of *caelestipileata* (darker/brighter; Figs. 2C–D and 4), which makes it possible to clearly distinguish them (Fig. 4; Hellmayr 1906, 1929) and to state that they occur in sympatry in south-west Amazonia (Fig. 1). The presence of *caelestipileata* in Madre de Dios in Peru was already known (Schulenberg *et al.* 2007, Snow 2020).

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L.c. exquisita

L.c. caelestipileata



Figure 4. Specimens of *L. c. exquisita* from eastern Acre and *L. c. caelestipileata* from Amazonas, Brazil, at MPEG, showing differences in crown colour, and matching their respective holotypes, taken under the same light conditions (Lincoln Silva Carneiro, © Museu Paraense Emílio Goeldi, Belém)

TABLE 1

Material evidence of sympatry of two subspecies of Blue-crowned Manakin *Lepidothrix coronata* in south-west Amazonia; see Fig. 1 (rectangle). * MPEG = Museu Paraense Emílio Goeldi, Belém; MZUSP = Museu de Zoologia da Universidade de São Paulo; MVZ = Museum of Vertebrate Zoology, Berkeley, CA.

| Taxon | Country | Locality | Date | Source/catalog number * | Specimen |
|-----------------------|---------|---------------------------------|------------|----------------------------|-------------------|
| L. c. exquisita | Brazil | Acre, Ramal Nabor Jr. | 07/06/2006 | MPEG 60803 | male, checked |
| L. c. exquisita | Brazil | Acre, Ramal Nabor Jr. | 07/06/2006 | MPEG 60804 | male, checked |
| L. c. exquisita | Brazil | Acre, Reserva Humaitá | 20/07/2007 | MPEG 63590 | male, checked |
| L. c. exquisita | Brazil | Acre, Reserva Humaitá | 24/07/2007 | MPEG 63656 | male, checked |
| L. c. exquisita | Bolivia | Pando, Prov. Nicolás Suarez | 10/07/1986 | MPEG 54188 | male, checked |
| L. c. caelestipileata | Brazil | Acre, rio Iquri | 28/08/1951 | MZUSP 35743 | male, checked |
| L. c. caelestipileata | Peru | Puerto Maldonado, Madre de Dios | 12/01/1982 | MVZ 169507 | female, unchecked |

Although Guilherme (2009, 2012) reported the presence of *exquisita* in eastern Acre based on the four specimens collected in 2006–07 (Table 1; Figs. 3A and 4), the Brazilian Committee on Ornithological Records (CBRO) (Piacentini *et al.* 2015) did not accept this taxon's occurrence in Brazil, alleging that eastern Acre 'comprises precisely the type locality of *L. c. caelestipileata*'. Guilherme (2016) reaffirmed the presence of *exquisita* in eastern Acre based on a comparison of four specimens collected there (Table 1; Figs. 3A and 4) with material attributed to *exquisita* from central Peru. However, the recent version of the CBRO checklist (Pacheco *et al.* 2021) again argued for excluding *exquisita*, ignoring the specimens from Acre (Table 1; Figs. 3A and 4), and also noted that Del-Rio *et al.* (2021) had confirmed

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ISSN-2513-9894 (Online)

that birds east of the Juruá are *caelestipileata*. Del-Rio *et al*. (2021) sampled a restricted region (Carauari) of the middle Juruá River *c*.550 km distant from locations where specimens in Acre were collected (Fig. 1).

327

Phylogeographic studies of Blue-crowned Manakin indicate that the current geographic distribution of the group is related to different vicariance events, such as the uplift of the Andes and formation of the modern drainage network in the Amazon lowlands (Cheviron et al. 2005, Reis et al. 2019). Some have defended the idea that it is floodplains (várzea) along main rivers that limit the occurrence of taxa in the L. coronata group (Del-Rio et al. 2021), however, neither vicariance nor the presence of floodplains can explain the sympatric presence of these two taxa in the south-east Inambari. Both must have reached the region by dispersing from their core areas, namely the Andean foothills (exquisita) and north-central Inambari (*caelestipileata*). This type of biogeographic encounter between parapatric taxa is not uncommon in Acre (Guilherme 2012) and corresponds to the southernmost contact zone in the south-west Amazonian lowlands proposed by Haffer (1997). Maintenance of this distribution pattern among sister taxa in this region may be related to environmental gradients (Tuomisto et al. 2003, 2019). In east Peru, north-west Bolivia and south-west Brazilian Amazonia (Acre and Amazonas), terra firme ecosystems are predominantly dominated by two forest typologies, those dominated by bamboo and forests with palms (Silveira et al. 2008, Carvalho et al. 2013). When these taxa meet due to dispersal, they appear to have adapted to use these different habitats thereby avoiding direct (interspecific) competition, occurring in the same geographic region but occupying different habitats (Carneiro et al. 2022). Increased ornithological knowledge of the region has shown that some species thought to occur only in the Andean foothills also occur in the adjacent lowlands in Peru, Brazil and Bolivia (Guilherme & Aleixo 2007, Tobias et al. 2008, Rego et al. 2009, Plácido et al. 2018), as well as species known only in the central-northern Inambari that have been recorded further south (Souza et al. 2018), just as suggested by Haffer (1997: 283).

Sympatric occurrence of these two subspecies of Blue-crowned Manakin in the southeast Inambari has biogeographic and phylogenetic implications. Relationships and species limits are still under debate within the genus *Lepidothrix* (Dias *et al.* 2018), in particular in the *L. coronata* group (Cheviron *et al.* 2005, Reis *et al.* 2019). If both taxa occur in the same geographic area and maintain their diagnosable morphological characteristics, it is possible that they have already completed their speciation process and are, in fact, species.

Acknowledgements

I am grateful to the following curators of ornithological collections consulted: Paul Sweet at the American Museum of Natural History, New York; Dr Manuel Schweizer at the Naturhistorisches Museum Bern; Dr Luís Fábio Silveira at the Museu de Zoologia da Universidade de São Paulo; and Maria de Fátima Cunha Lima and Dr Lincoln Silva Carneiro at the Museu Paraense Emílio Goeldi, Belém, for providing data and photos of specimens, including the relevant holotypes. I also thank Kathrin Nere Passarinho (Federal University of Acre) who helped me with reading the reference written in German.

References:

- Carneiro, L., Burlamaqui, T. C. T., Aleixo, A., Oren, D. C. & Silva, J. M. C. 2022. Biogeography and diversification of bare-eyes, an endemic Amazonian clade. J. Biogeogr. 49: 1110–1123.
- Carvalho, A. L., Nelson, B. W., Bianchini, M. C., Plagnol, D., Kuplich, T. M. & Daly, D. C. 2013. Bamboodominated forests of the southwest Amazon: detection, spatial extent, life cycle length and flowering waves. *PLoS ONE* 8: e54852.
- Cracraft, J. 1985. Historical biogeography and patterns of differentiation within the South American avifauna: areas of endemism. Pp. 49–84 *in* Buckley, P. A., Foster, M. S., Morton, E. S., Ridgely, R. S. & Buckley, F. G. (eds.) *Neotropical ornithology. Orn. Monogr.* 36.
- Del-Rio, G., Mutchler, M. J., Costa, B., Hiller, A. E., Lima, G., Matinata, B., Salter, J. F., Silveira, L. F., Rego, M. A. & Schmitt, D. C. 2021. Birds of the Juruá River: extensive várzea forest as a barrier to terra firme birds. J. Orn. 162: 565–577.

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ISSN-2513-9894 (Online)

Dias, C., Lima, K. D. A., Araripe, J., Aleixo, A., Vallinoto, M., Sampaio, I. & Rego, P. S. D. 2018. Mitochondrial introgression obscures phylogenetic relationships among manakins of the genus *Lepidothrix* (Aves: Pipridae). *Mol. Phylo. & Evol.* 126: 314–320.

328

- Goeldi, E. 1905. Nova zoologica aus der Amazonas-Region. Neue Wirbeltiere. Proc. Sixth Congr. Intern. Zool., Bern 7: 542–549.
- Guilherme, E. 2009. Avifauna do Estado do Acre: composição, distribuição geográfica e conservação. Ph.D. thesis. Museu Paraense Emílio Goeldi, Univ. Federal do Para, Belém.
- Guilherme, E. 2012. Birds of the Brazilian state of Acre: diversity, zoogeography, and conservation. *Rev. Bras. Orn.* 20: 393–442.
- Guilherme, E. 2016. Aves do Acre. Ed. Edufac, Rio Branco.
- Guilherme, E. & Aleixo, A. 2008. Primeiros registros de Xiphorhynchus chunchotambo (Tschudi, 1884) (Dendrocolaptidae) no Brasil. Rev. Bras. Orn. 16: 44–46.
- Haffer, J. 1997. Contact zones between birds of southern Amazonia. Pp. 281–305 in Remsen, J. V. (ed.) Studies in Neotropical ornithology honoring Ted Parker. Orn. Monogr. 48.
- Hellmayr, C. E. 1905. [On four new species of South American birds]. Bull. Brit. Orn. Cl. 15: 54-57.
- Hellmayr, C. E. 1906. A revision of the species of the genus Pipra. Ibis 21: 1-46.
- Hellmayr, C. E. 1929. Catalogue of birds of the Americas, pt. VI. Publ. Field Mus. Nat. Hist. Zool. Ser. 13(6).
- Kirwan, G. M. & Green, G. 2012. Cotingas and manakins. Princeton Univ. Press.
- Pacheco, J. F., Silveira, L. F., Aleixo, A., Agne, C. E., Bencke, G. A., Bravo, G. A, Brito, G. R. R., Cohn-Haft, M., Mauricio, G. N., Naka, L. N., Olmos, F., Posso, S., Lees, A.C., Figueiredo, L. F. A., Carrano, E., Guedes, R. C., Cesari, E., Franz, I., Schunck, F. & Piacentini, V. Q. 2021. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee – second edition. *Orn. Res.* 29(2): 1–115.
- Piacentini, V. Q., Aleixo, A., Agne, C. E., Maurício, G. N., Pacheco, J. F., Bravo, G. A., Brito, G. R. R., Naka, L. N., Olmos, F., Posso, S., Silveira, L. F., Betini, G. S., Carrano, E., Franz, I., Lees, A. C., Lima, L. M., Pioli, D., Schunck, F., Amaral, F. R., Bencke, G. A., Cohn-Haft, M., Figueiredo, L. F. A., Straube, F. C. & Cesari, E. 2015. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee / Lista comentada das aves do Brasil pelo Comitê Brasileiro de Registros Ornitológicos. *Rev. Bras. Orn.* 23: 91–298.
- Pinto, O. M. O. & Camargo, E. A. 1954. Resultados ornitológicos de uma expedição ao território do Acre pelo Departamento de Zoologia. *Pap. Avuls. Depto. Zool.* 23: 371–418.
- Plácido, R. A. A, Fernandes, L. F. A., Almeida, R. F. R. & Guilherme, E. 2018 First record of the cf. Rufouscrested Coquette, *Lophornis* cf. *delattrei* (Aves, Trochilidae), from Brazil. *Check List* 14: 121–124.
- Rego, M. A., Dantas, S. M., Guilherme, E. & Martuscelli, P. 2009. First records of the Fine-barred Piculet (*Picumnus subtilis*) for Brazil. *Bull. Brit. Orn. Cl.* 129: 182–185.
- Reis, C. A., Dias, C., Araripe, J., Aleixo, A., Anciães, M., Sampaio, I. & Rêgo, P. 2019. Multilocus data of a manakin species reveal cryptic diversification moulded by vicariance. *Zool. Scripta* 49: 129–144.
- Schulenberg, T. S., Stotz, D. F., Lane, D. F., O'Neill, J. P. & Parker, T. A. 2007. Birds of Peru. Princeton Univ. Press.
- Silva, J. M. C., Rylands, A. & Fonseca, G. A. 2005. O destino das áreas de endemismo da Amazônia. Megadiversidade 1: 124–131.
- Silveira, M., Daly, D. C., Salimon, C. I., Wadt, P. G. S., Amaral, E. F., Pereira, M. G. & Passos, V. 2008. Ambientes físicos e coberturas vegetais do Acre. Pp. 36–46 in Daly, D. C. & Silveira, M. (eds.) Primeiro catálogo da flora do Acre, Brasil / First catalogue of the flora of Acre, Brasil. Edufac, Rio Branco.
- Snow, D. 2020. Blue-crowned Manakin (*Lepidothrix coronata*), version 1.0. *In* del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Birds of the world*. Cornell Lab of Ornithology, Ithaca, NY. https://doi.org/10.2173/bow.blcman1.01.
- Souza, J. R. D., Plácido, R. A. A., Guilherme, E. & Melo, T. N. 2018. First record of the *Pyrrhura lucianii* Deville, 1851 (Psittaciformes, Psittacidae) in Acre, Brazil, with notes on the consumption of salt. *Check List* 14: 285–289.
- Tobias, J. A., Lebbin, D. J., Aleixo, A., Andersen, M. J., Guilherme, E., Hosner, P. A. & Seddon, N. 2008. Distribution, behavior, and conservation status of the Rufous Twistwing (*Cnipodectes superrufus*). Wilson J. Orn. 120: 38–49.
- Tuomisto, H., Ruokolainen, K. & Yli-Halla, M. 2003. Dispersal, environmental, and floristic variation of western Amazonian. Science 299(5604): 241–244.
- Tuomisto, H., van Doninck, J., Ruokolainen, K., Moulatlet, G. M., Figueiredo, F. O. G., Sirén, A., Cárdenas, G. G., Lehtonen, S. & Zuquim, G. 2019. Discovering the floristic and geoecological gradients across Amazonia. J. Biogeogr. 46: 1734–1748.
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