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Alpha taxonomy of *Synallaxis stictothorax* group (Aves: Passeriformes: Furnariidae): *Synallaxis chinchipensis* Chapman, 1925 as a valid species, with a lectotype designation

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Abstract

The *Synallaxis stictothorax* group comprises poorly understood South American Furnariidae. This paper aims to present the morphological and nomenclatural aspects of this group, re-describing its valid species and to propose a fresh nomenclatural treatment for group members. Our analysis corroborated the specific status of the disputed taxon *Synallaxis chinchipensis* and refuted the diagnostic characteristics of the subspecies *Synallaxis stictothorax maculata*. Following the recommendations of the *Code*, a lectotype was designated to the nominal species *Synallaxis hypochondriaca*. We also draw attention to the need for continued review of the taxonomy of polytypic species, as this is the most efficient way of distinguishing natural groups from those that are merely historical artefacts of bird taxonomy.

Key words

Synallaxis chinchipensis, *Synallaxis hypochondriaca*, subspecies, Taxonomy.

Introduction

Within the genus *Synallaxis* Vieillot, 1818, nearly 90 taxa are considered valid (*e.g.* Dickinson & Christidis, 2014), including those belonging to the clade composed of *Synallaxis stictothorax* Sclater, 1859 and *Synallaxis hypochondriaca* (Salvin, 1895) (Derryberry *et al.*, 2011). According to Derryberry *et al.* (2011), the *Synallaxis stictothorax* species group encompasses *Synallaxis stictothorax* Sclater, 1859, *Synallaxis hypochondriaca* (Salvin, 1895) and *Synallaxis zimmeri* Koepcke, 1957. The hypotheses of relationships between these species and other genera of the family Furnariidae have a long history of discussion, and the status of subspecies of some taxa remains disputed.

The first discussions involving the relationships of *S. stictothorax* to the other representatives of the family Furnariidae began with Peters (1951), who retained it in this genus as a valid species despite some misgivings. The author noted that the tail shape and plumage colour patterns were discordant with those of other species then assigned to *Synallaxis*, calling attention to the similarity between *S. stictothorax* and *S. hypochondriaca*, at that time non-congeneric species. Although currently treated

in the genus *Synallaxis*, *S. hypochondriaca* is the type species by original designation of the monotypic genus *Siptornopsis* Cory, 1919, a formally valid genus until Ohlson *et al*. (2013). Vaurie (1971, 1980) agreed that the relationships between *S. stictothorax* and the other species of genus *Synallaxis* required further consideration although he was quite certain that *S. stictothorax* belongs to *Synallaxis* in stating "…that this species may not be a *Synallaxis* seems totally unwarranted to me" (Vaurie, 1971: 21). Later, Remsen (2003) emphasized that *S. stictothorax* may be more closely related to *Siptornopsis* or *Cranioleuca* Reichenbach, 1853 than to *Synallaxis*, but did not suggest any amendments to the nomenclature of the group.

Derryberry *et al*.'s account (2011) was the first to examine the relationships between Furnariidae from a phylogenetic perspective including specimens of the *S. stictothorax* group. In that study, the clade formed by *S. stictothorax* and *S. zimmeri* was inferred to be the sister group of *S. hypochondriaca*. Later, as mentioned below, Ohlson *et al*. (2013) merged *Siptornopsis* with *Synallaxis*, thereby solving the issue of paraphyly of *Synallaxis*.

When investigating evolutionary trends in the phenotypes and habitats of furnariid taxa, Tobias *et al*. (2014) used the same taxa as Derryberry *et al*. (2011), but added the subspecies *Synallaxis stictothorax chinchipensis* Chapman, 1925 and *Synallaxis stictothorax maculata* Lawrence, 1874, yielding results that were relevant to the taxonomy of the *S. stictothorax* species group. Among these results, *S. chinchipensis* appeared as the sister group of *S. hypochondriaca*, which was unexpected considering that *S. chinchipensis* is usually referred to as a subspecies of *S. stictothorax*.

At the intraspecific level, although the majority of catalogues considered *S. chinchipensis* as a subspecies of *S. stictothorax* (*e.g*. Peters, 1951; Vaurie, 1980; Remsen, 2003; Dickinson & Christidis, 2014), popular handbooks (*e.g*. Sibley & Monroe, 1990; Ridgely & Tudor, 1994; Ridgely & Greenfield, 2001; del Hoyo *et al*., 2016) overwhelmingly treated *S. chinchipensis* as a distinct species. *Synallaxis s. maculata*, in turn, was considered a junior synonym of *S. stictothorax* by Sclater (1874) until Cory & Hellmayr (1925), who considered this taxon as a subspecies of *S. stictothorax*, an opinion followed by Peters (1951). Vaurie (1980), in his revision of the family Furnariidae, stated, "In *Synallaxis stictothorax* I recognise nominate *stictothorax* ranging from southwestern Ecuador to north-western Peru, and *chinchipensis* in the valleys of Cajamarca". Ridgely & Tudor (1994) followed the decision by Vaurie (1980) in not considering *S. s. maculata* a valid taxon, until Remsen (2003) reversed such assessment. *Synallaxis stictothorax piurae* Chapman, 1919 was considered a junior synonym of *S. s. maculata* by Chapman (1925) and Cory & Hellmayr (1925). This decision was followed by all subsequent authors (*e.g*. Peters, 1951; Ridgley & Tudor, 1994; Remsen, 2003; Dickinson & Christidis, 2014; del Hoyo *et al*., 2016).

Since there is flagrant disagreement regarding the validity of species and subspecies belonging to *S. stictothorax* species group, the main objective of this study is to evaluate the taxonomic status of each of them based on morphology, re-describing those considered valid. In line with the results achieved, we undertook a review of their nomenclatural aspects, respecting the guidelines expressed in the the *Code* (Anonymous, 1999).

Materials and Methods

Both morphometric characteristics and plumage colour were analysed from 130 specimens, including the type specimens of *Synallaxis stictothorax stictothorax* Sclater, 1859, *Synallaxis stictothorax maculata* Lawrence, 1874, *Synallaxis stictothorax piurae* Chapman, 1919, *Synallaxis stictothorax chinchipensis* Chapman, 1925, *Synallaxis hypochondriaca* (Salvin, 1895) and *Synallaxis zimmeri* Koepcke, 1957 housed at nine scientific institutions as detailed in the Appendix. A total of 29 institutions were consulted for analysis of specimens, but only nine had skins available for the study.

The morphometric analysis included the following measurements: bill length (taken from exposed culmen to tip of bill), bill height (taken at level of the nostril), wing length (chord), and tail length (length of central rectrices). The first three measurements were obtained using a calliper (precision 0.05 mm), whereas the last measurement was obtained using both a calliper and millimetre ruler (precision 0.1 mm). The number of rectrices was also recorded. For the plumage analysis, we documented the colour for 14 areas of the body (ventral, dorsal, and lateral sequence: throat, lateral throat, breast, abdomen, side, flank, rectrices, upper tail coverts, back, crown, forehead, superciliary line, wing coverts and remiges) using Smithe (1975, 1981) coding to describe the colours, and the anatomical topography of Proctor & Lynch (1993).

Descriptive statistics (mean, standard deviation, minimum and maximum values), normality tests and homoscedasticity tests, scatterplots, principal component analysis (PCA type: covariance; matrix data log-transformed; and pairwise deletion for missing data) and discriminant analysis, were generated using the xlstat 2020.1.3 software (Addinsoft, 2020) considering a significance level of 5%. In addition, qgis 2.4.0 was used to generate distribution maps, which were based on georeferenced data, according to Stephens & Traylor (1983), and Paynter (1993). Specimens that were unsexed, juvenile, moulting or damaged were not included in either the morphometric or plumage analyses, as well as the specimen of *S. zimmeri* due to the fact that only one specimen was analysed (paratype AMNH 461650).

Table 1. Plumage colour of *Synallaxis stictothorax*, *S. chinchipensis* and *S. hypochondriaca* according Smithe (1975, 1981) and topography according Proctor & Lynch (1993). Asterisk (*) for the diagnostic character.

Character	Character state	Smithe's colours	*S. stictothorax* (%)	*S. chinchipensis* (%)	*S. hypochondriaca* (%)
Throat	White	—	100	100	100
Lateral throat	White	—	89	63	100
	White + spot cinnamon	39	11	37	0
Breast	White (± macula or stretch marks brown)	(± 121 or 221)	100	100	100
Abdomen	White	—	100	100	100
Side*	Cinnamon	39	100	0	0
	White (± macula or stretch marks brown)	(± 121 or 221)	0	100	0
	White + umber (± stretch marks brown)	123 (± 121 or 221)	0	0	100
Flank*	Cinnamon	39	100	0	0
	White + cinnamon (± maculas or stretch marks brown)	39 (± 121 or 221)	0	100	0
	White + umber	123	0	0	100
Rectrices	Rufous (± Brown)	340 or 136 (± 221)	100	100	0
	Dark drab (± Brown)	119B (± 221)	0	0	100
Upper tail coverts	Rufous	340 or 136	100	100	0
	Dark drab	119B	0	0	100
Back	Dark drab (± Rufous)	119B (± 340)	100	100	100
Crown	Dark drab (± Brown)	119B (± 119A)	100	100	100
Forehead*	White (± stretch marks brown)	(± 121 or 221)	100	0	0
	Dark drab + cinnamon (± stretch marks brown)	119B + 39 (± 121 or 221)	0	100	0
	Dark drab	119B	0	0	100
Superciliary line	White	—	100	0	100
	Cinnamon	39	0	100	0
Wing coverts	Rufous	340 or 136	100	100	100
Remiges	Brown	121 or 221	100	100	100

Results

The plumage analysis clearly distinguished *Synallaxis stictothorax chinchipensis* Chapman, 1925 from the remaining taxa, based on the colour patterns of the side, flank, and forehead (Table 1 and Figs 1 to 3), which are unique character states and, therefore, fully diagnostic.

Table 2 presents the descriptive statistical analysis of the morphometric data of the studied taxa. The results of normality and homoscedasticity tests indicated the use of data log-transformed for analyses. Despite the morphometric similarity between *S. stictothorax* and *S. chinchipensis* when compared to *S. hypochondriaca*, the principal component analysis (Fig. 3) and discriminant analysis corroborated the division of the taxa into three distinct groups: *S. stictothorax*, *S. chinchipensis* and *S. hypochondriaca*. In the principal component analysis, the first component (PC1) accounted for 92% of the morphometric variation and was mainly influenced by tail and bill length, whereas PC2 was responsible for 5% of the variation, being mainly influenced by bill length. Therefore, when considered together, the two principal components accounted for 97% of the total morphometric variation.

Concerning the discriminant analysis, 100% of the *S. stictothorax* and *S. hypochondriaca* specimens (previously identified by plumage characters) could be correctly identified on the basis of morphometric measurements, whereas 94% of *S. chinchipensis* specimens were correctly identified, with just one individual (MVZ 163833) being incorrectly identified as *S. stictothorax*. Therefore, 99% of the specimens could be correctly identified as *S. stictothorax*, *S. chinchipensis* and *S. hypochondriaca* based on the discriminant analysis of the morphometric data. Those data strongly corroborate the hypothesis of the existence of three different morphological groups, as suggested by plumage colour.

There was no overlap between the ranges of bill height and wing length when comparing *S. hypochondriaca* to either *S. stictothorax* or *S. chinchipensis* (Table 2), the values of which were consistently smaller than those of *S. hypochondriaca*. The results also indicated that the bill length of *S. stictothorax* was diagnostically smaller

Fig. 1. Specimens that illustrate the morphological variation between *Synallaxis chinchipensis* (left) and *S. stictothorax* (right): A) ventral view, MVZ 163831 and MVZ 163683; B) dorsal view, MVZ 163831 and MVZ 163683; C) lateral view MVZ 163831 and MVZ 163683; and D) forehead detail, AMNH 182060 and AMNH 129789.

than that of *S. hypochondriaca*; however, such a distinction was not observed for the bill lengths of *S. chinchipensis* and *S. hypochondriaca* as the ranges of values observed for the two species overlapped.

In addition, the means of the morphometric measurements of *S. stictothorax* were always smaller than those of *S. chinchipensis*, but these could not be used to discriminate the species as they displayed overlapping rang-

Fig. 2. Specimens that illustrate the morphological variation between *Synallaxis hypochondriaca* (left) (AMNH 523868, paralectotype of *Siptornis hypochondriacus* Salvin, 1895) and *Synallaxis stictothorax* (right) (AMNH 129789): A) ventral view; B) dorsal view; and C) side view.

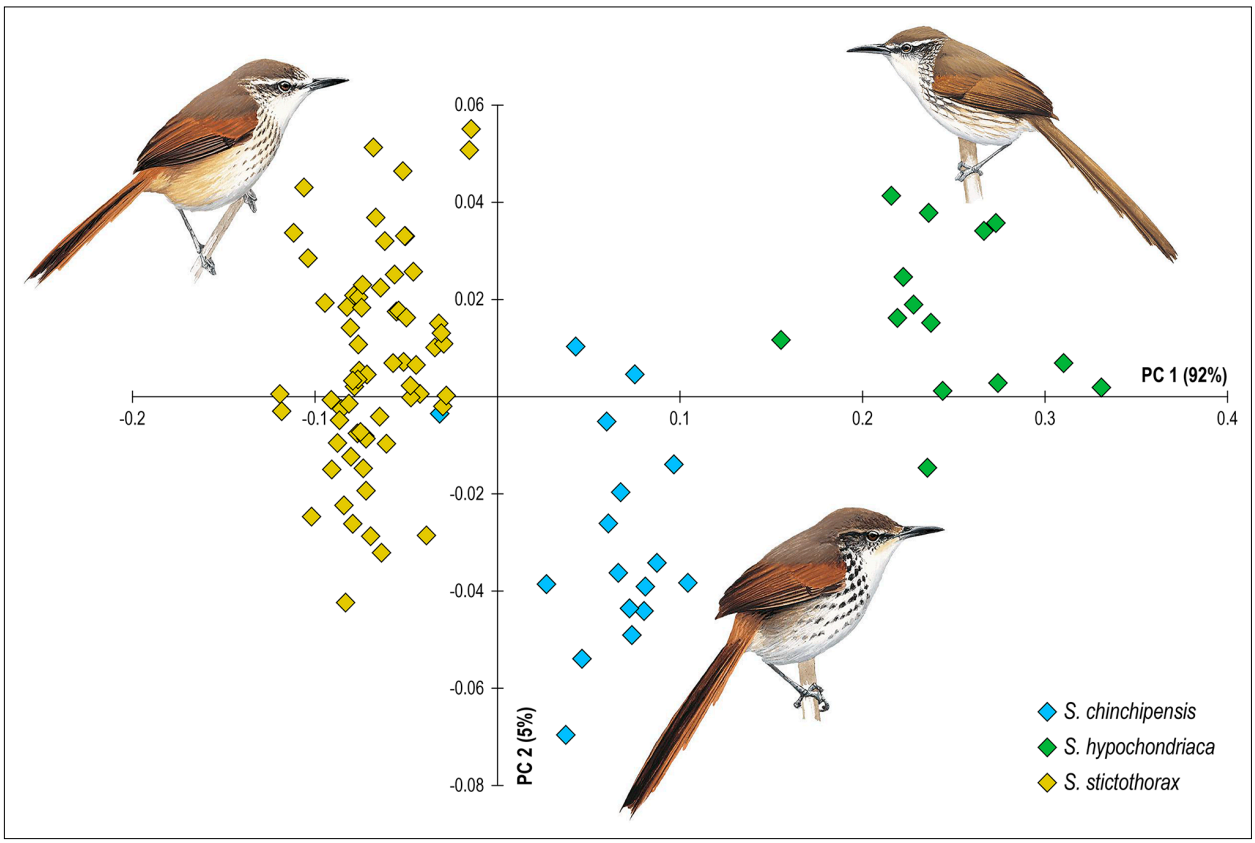

Fig. 3. Scatterplots showing the results of Principal Component Analysis for the morphometric data of *Synallaxis stictothorax*, *S. chinchipensis* and *S. hypochondriaca*. *Illustrations from del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A. & de Juana, E. (2017). *Handbook of the Birds of the World Alive*, Barcelona, Lynx Edicions (retrieved from http://www.hbw.com on 10.10.2017).

Table 2. Descriptive statistics of morphometric data of *Synallaxis stictothorax*, *S. chinchipensis* and *S. hypochondriaca*. , mean; SD, standard deviation; min, minimum values; max, maximum values; *n*, number of specimens; mm, millimeters.

	Bill length (mm)			Bill height (mm)			Wing length (mm)			Tail length (mm)			Rectrices
	± SD	min – max	*n*	± SD	min – max	*n*	± SD	min – max	*n*	± SD	min – max	*n*	
S. stictothorax													
General	11.51±٠,٤٦	10.35 – 12.77	77	3.19±٠,١٥	2.82 – 3.52	72	50.58±١,٦١	46.01 – 55.11	81	55.55±٣,٥٩	48.00 – 69.00	74	10
Females	11.57±٠,٤٤	10.39 – 12.39	25	3.16±٠,١٧	2.82 – 3.50	24	49.68±١,٢٦	47.67 – 52.11	25	55.15±٣,٣٥	50.00 – 60.00	23	10
Males	11.51±٠,٤٥	10.35 – 12.77	49	3.20±٠,١٤	2.85 – 3.52	45	51.05±١,٦١	46.01 – 55.11	53	55.85±٣,٧٦	48.00 – 69.00	48	10
S. chinchipensis													
General	14.48±٠,٨٦	12.15 – 15.84	26	3.56±٠,١٦	3.16 – 3.81	25	51.14±١,٦٥	47.89 – 53.65	25	66.37±٣,١٦	60.00 – 72.00	19	10
Females	14.25±٠,٩٩	12.15 – 15.40	11	3.43±٠,١٤	3.16 – 3.63	10	50.40±١,٨٨	47.89 – 53.63	10	64.64±٢,٥٣	61.00 – 68.00	7	10
Males	14.64±٠,٧٤	12.93 – 15.84	15	3.64±٠,١٠	3.43 – 3.81	15	51.64±١,٣٢	49.41 – 53.65	15	67.38±٣,١٤	60.00 – 72.00	12	10
S. hypochondriaca													
General	16.99±١,٥٥	15.01 – 19.66	11	4.43±٠,٢٥	4.19 – 4.97	9	63.33±٢,٩١	60.47 – 68.57	11	85.00±٧,٩١	69.00 – 94.00	11	12
Females	16.64±٠,٩١	15.48 – 17.93	6	4.32±٠,١٠	4.19 – 4.45	6	61.22±١,٠١	60.47 – 63.11	6	87.33±١,٥١	85.00 – 89.00	6	12
Males	18.00±١,٩١	15.46 – 19.66	4	4.64±٠,٣٦	4.25 – 4.97	3	66.09±٢,٥٧	63.18 – 68.57	4	85.50±١٠,٤١	71.00 – 94.00	4	12

es. The means of female specimens were also consistently smaller than those of the male specimens, regardless of species.

Regarding their geographical distribution, *S. stictothorax*, *S. chinchipensis* and *S. hypochondriaca* are allopatric, with no known overlap (Fig. 4). *Synallaxis stictothorax* was found in southwest Ecuador and northwestern Peru, below 400 meters, whereas *S. hypochondriaca* and *S. chinchipensis* were both found in the Río Marañón valley, Cajamarca, Peru. However, *S. hypochondriaca* and *S. chinchipensis* were separated by more than 2,000 meters of altitude, as *S. chinchipensis* was only collected in the margins of the Chinchipe River, between 400 and 600 m (according to del Hoyo, 2020) while *S. hypochondriaca* specimens occur between 2,000 and 2,800 meters elevation (according to Remsen, 2003 and Lloyd, 2020). The altitudinal difference between distributions of the species of this group was, was, apparently, not considered by BirdLife International (2020) when trying to stablish the geographical occurrence of *S. chinchipensis*. Apparently BirdLife International (2020) estimated the area of occurrence of *S. chinchipensis* as the entire Marañón River Valley, disregarding the fact that the species is restricted to a small portion of the valley between 400 and 600 meters. Fig. 4 illustrates the distribution of the species, based on altitude information and specimens from scientific collections.

This spatial distribution of the species in the Andean Mountains may correspond to the differences found in the two species' body size, a pattern already well known in that region (e.g. Winger & Bates, 2015). This correlates with the predictions of Bergmann's rule, which proposes that greater body size is beneficial to individuals that face lower temperatures (Bergmann, 1847; Graves, 1985).

Synallaxis stictothorax Sclater, 1859

Synallaxis stictothorax Sclater, 1859: 191. Syntypes, by original designation: NHMUK 1841.4.2.471 and NHMUK 1886.6.24.455, both from Guayaquil, Ecuador; according to Paynter (1993) the coordinates are 02°10′S, 79°50′W, at sea level. Lectotype, by present designation: NHMUK 1841.4.2.471, adult male (see **Remark 1)**.

Synallaxis stictothorax maculata Lawrence, 1874: 186. Holotype, by original monotypy: Museum of Vassar College nº 2437, from Tumbes, Peru; according to Stephens & Traylor (1983) the latitude and longitude are 03°34′S, 80°28′W, respectively (see **Remarks 2 and 3**).

Synallaxis stictothorax piurae Chapman, 1919: 257. Holotype, by original designation: AMNH 163085, adult female from Chilaco, near Samate (= Somate), on the Río Chira, Piura, Peru, ca. 100 m elevation; the coordinates are 04°43′S, 80°31′W, according to Stephens & Traylor (1983) and LeCroy & Sloss (2000) (see **Remark 3**).

Diagnosis. *Synallaxis stictothorax* is distinguishable from *S. hypochondriaca* and *S. chinchipensis* by the colour of the lower part of the side of the body and flanks, which is cinnamon (39), contrasting with the umber (123) lower part of the sides of the body with brown spot-streaks (121

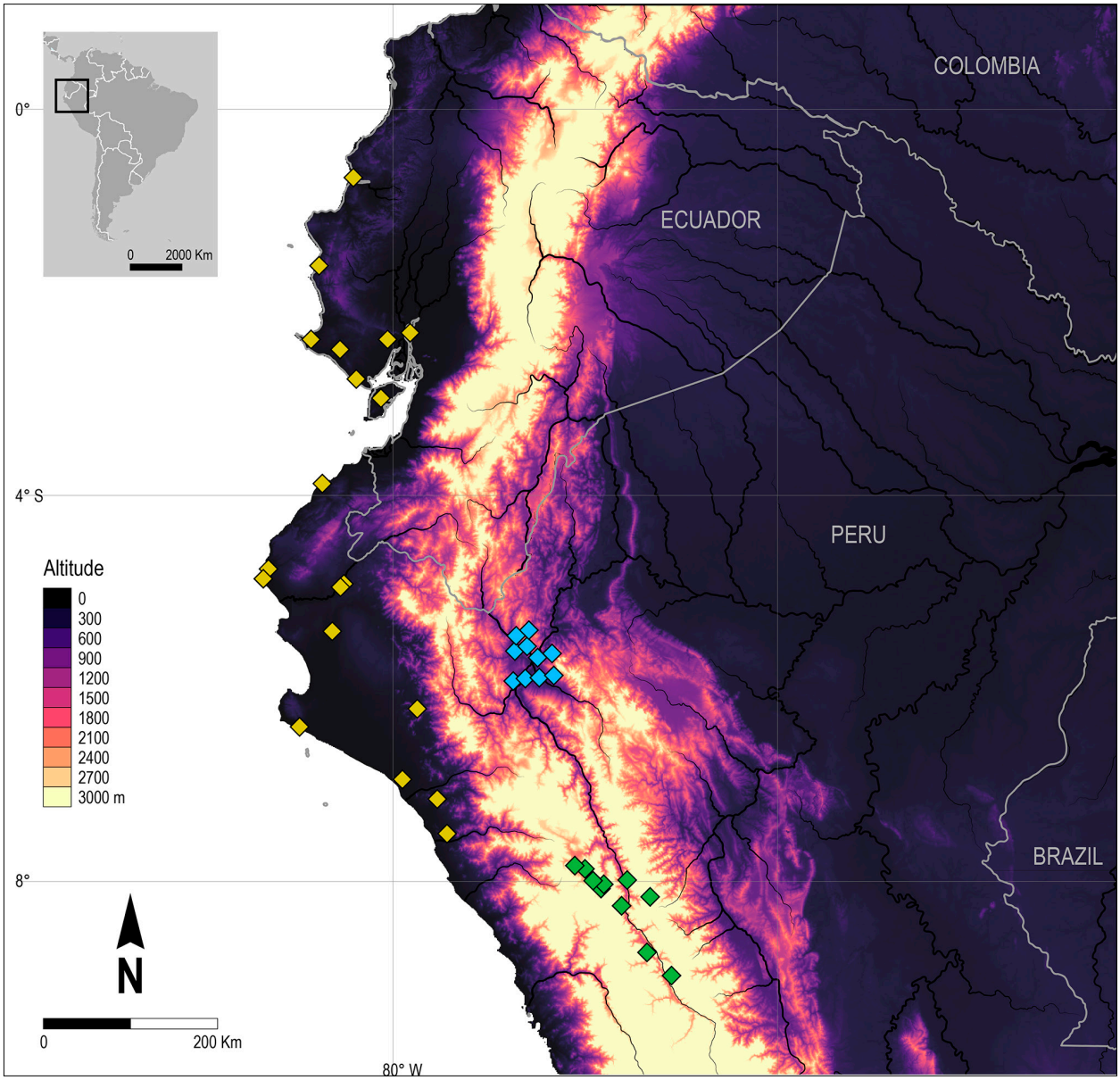

Fig. 4. Map of northwestern South America with the plotted distributions of *Synallaxis stictothorax* (yellow diamond), *S. hypochondriaca* (green diamond) and *S. chinchipensis* (blue diamond) based on examined skins, being that one symbol may represent more than one specimen.

or 221) in *S. hypochondriaca*, and the white with brown spot-streaks (121 or 221) of *S. chinchipensis*. Additionally, the white forehead with spot-streaks (121 or 221) of *S. stictothorax* contrasts with the dark drab (119B) forehead of *S. hypochondriaca* and the dark drab (119B) or cinnamon (39) with brown stretch marks (121 or 221) of *S. chinchipensis*. *Synallaxis stictothorax* is further diagnosable from *S. hypochondriaca* by possessing: five pairs of rectrices and rufous (340 or 136) upper tail coverts, compared to *S. hypochondriaca*, which presents six pairs of rectrices and dark drab (119B) upper tail coverts; bill length varying from 10.35 to 12.77 mm, compared to *S. hypochondriaca* with bill length ranging from 15.01 to 19.66 mm; bill height varying from 2.82 to 3.52 mm, compared to *S. hypochondriaca* with bill height ranges from 4.19 to 4.97 mm; and by wing length, which ranges from 46.01 to 55.11 mm in *S. stictothorax*, versus from 60.47 to 68.57 mm in *S. hypochondriaca*. *Synallaxis stictothorax* is still diagnosable from *S. chinchipensis* by having: a cinnamon (39) flank, which is white and cinnamon (39) with brown spot-streaks (121 or 221) in *S. chinchipensis*; and a white superciliary line, versus the cinnamon (39) one of *S. chinchipensis*. Finally, *S. stictothorax* is also distinguishable from all other species of the genus *Synallaxis* by its white breast with brown spot-streaks (121 or 221; see Figs. 1 and 2 and Tables 1 and 2).

Description. White throat; lateral part of the throat white with cinnamon spot-streaks (39) (on each side) on some individuals; white breast with a greater or lesser presence of brown spot-streaks (varying between 121 or 221); white abdomen; sides and upper part white with more or

less presence of brown spot-streaks (varying between 121 or 221) and cinnamon underside (39); cinnamon flanks (39) without spot-streaks; five pairs of rufous rectrices (varying between 340 or 136), in some individuals the vexilla are partially brown (221), giving a two-colour appearance to the rectrices; rufous upper tail coverts (varying between rufous 340 or 136); dark drab back (119B) with greater or lesser presence of the rufous (340); dark drab crown (varying between 119B or 119A); forehead white with brown spot-streaks (varying between 121 or 221); white superciliary line; rufous wing coverts (varying between 340 and 136); remiges brown (varying between 121 and 221). Bill length varying from 10.35 to 12.77 mm; bill height varying from 2.82 to 3.52 mm; wing length varying from 46.01 to 55.11 mm; and tail length from 48.00 to 69.00 mm. No sexual dimorphism was detected regarding plumage colour, but in the morphometric data, the wing length was smaller in females than in males (see Figs. 1 to 3, Tables 1 and 2).

Distribution. *Synallaxis stictothorax* occurs in southwest Ecuador (central Manabí, south to west Guayas, Isla Puna and south Loja) to northwestern Peru (Tumbes, Piura, Lambayeque, La Libertad) as shows Fig. 4 and according to Remsen (2003: 289) and Dickinson & Christidis (2014: 139). According to (Lloyd, 2020) it lives in "dry scrub and open woodland below 200 meters in elevation." and according to del Hoyo (2020) in "arid lowland scrub, also deciduous woodland edge; below 400 m."

Remark 1. Sclater (1859), in the original description of *S. stictothorax*, mentioned a specimen from the William Jardine (1800–1874)'s collection and another specimen that was caught in Guayaquil, Ecuador, presented by G. W. Barclay, and sent to the British Museum (= Natural History Museum, Tring, England, NHMUK). According to Warren & Harrison (1971), the second one is the specimen NHMUK 1841.4.2.471, obtained during the voyage of the H.M.S. Sulphur, an English vessel utilized to explored the Pacific coast of the Americas from 1836 to 1837 (for details see Gray *et al*., 1844). Nevertheless, Warren & Harrison (1971) cited another syntype preserved at the Natural History Museum but they did not provide any further detail on it. During our analysis of the NHMUK bird collection, it became clear that this syntype is NHMUK 1886.6.24.455, also a specimen from Guayaquil, Ecuador, from Jardine's collection, with the reference to William Jameson (1796–1873) and date of July 1850. Both specimens are syntypes under the provisions of article 73.2 of the *Code* (Anonymous, 1999), and according to Article 74.6 (Fixation of lectotype by inference of holotype or "the type" before 2000) we believe that specimen NHMUK 1841.4.2.471 should be considered the lectotype of *Synallaxis stictothorax* Sclater, 1859, as Sclater (1890: 49) strictly indicated G. W. Barclay's specimen as the type of this species.

Remark 2. The holotype of *Synallaxis stictothorax maculata* Lawrence, 1874, according to its original description, comes from the J. Orton (1830–1877)'s collection, which is originally preserved at the Museum of Vassar College, now Warthin Museum of Geology & Natural History, Vassar College, Poughkeepsie, USA. The current curator, after consulting the museum files, informed us that Orton's specimen of *S. s. maculata* was likely taken to have been destroyed on January 3, 1943, probably due to its advanced stage of degradation (Lois Horst, *in litt*.). We have also unfruitfully searched for this specimen at the American Museum of Natural History, New York, USA, and at the New York State Museum, Albany, USA, whose ornithological collections historically received material from the Vassar College.

Remark 3. *Synallaxis stictothorax piurae* Chapman, 1919 was considered a junior synonym of *S. stictothorax maculata* Lawrence, 1874 by Chapman (1925: 8) who stated that "Dr. Hellmayr calls my attention to the fact that *maculata* Lawr. (1874, Ann. Lyc. Nat. Hist., N. Y., p. 186) antedates my *piurae."*. Besides the fact that the author of the species (Chapman, 1925) has considered *S. s. piurae* Chapman, 1919 a junior synonym of *S. s. maculata* Lawrence, 1874 our analysis of type series and topotypes (in the case of *S. s. maculata*, see Remark 2), corroborates the absence of characters useful to distinguish between those taxa, as indicated at Table 3. The same can be said about *S. s. maculata* in relation to *S. stictothorax*. Lawrence (1874) in describing *S. s. maculata* compared his new species with *S. gujanensis* (Gmelin, 1789), in spite of comparing it with *S. stictothorax*, probably, because he was not aware of the description previously published by Sclater (1859). This situation was resolved by Sclater (1890) who considered *S. maculata* a junior synonym de *S. stictothorax*. Cory & Hellmayr (1925: 99) mentioned the importance of the variation on rufous extension in remiges and rectrices in distinguishing *S. s. maculata* from *S. stictothorax* "*Synallaxis stictothorax maculata* Lawrence: Similar to *S. s. stictothorax*, but back more rufescent brown; cinnamon rufous area at base of remiges more extensive; tail almost wholly rufous, only the median pair of rectrices being washed with dusky on terminal portion of inner web." This variation is also reported by Vaurie (1980: 123), but he considered that "Although the population of *stictothorax* which inhabits northwestern Peru is clearly differentiated from that of southwestern Ecuador, their ranges are continuous and the differences between the two populations are relative only,… In *Synallaxis stictothorax* I recognize nominate *stictothorax* ranging from southwestern Ecuador to northwestern Peru, and *chinchipensis* in the valleys of Cajamarca." Ridgely & Tudor (2009) pointed out that the variation of the amount of rufous in rectrices as the primary cause of the bicolored rectrices effect (see Figs. 1B e 2B) presented by the majority of individuals of *S. stictothorax* from Ecuador and absent in individuals from southern Ecuador and Peru. Notwithstanding that, these authors made no taxonomic distinction based on such characters, considering it as a simple plumage variation. Our analysis indicated that such a variation in rectrices and remiges exists along the

Table 3. Plumage colour of lectotype of *S. stictothorax*, topotype of *S. s. maculata* and holotype of *S. s. piurae*, according Smithe (1975, 1981) and topography according Proctor & Lynch (1993).

Character	Lectotype of *S. stictothorax* (NHMUK 1841.4.2.471)	Topotype of *S. s. maculata* (MVZ 163779)	Holotype of *S. s. piurae* (AMNH 163085)
Throat	White	White	White
Lateral throat	White	White	White
Breast	White ± macula or stretch marks brown (121)	White ± macula or stretch marks brown (121)	White ± macula or stretch marks brown (121)
Abdomen	White	White	White
Side	Cinnamon (39)	Cinnamon (39)	Cinnamon (39)
Flank	Cinnamon (39)	Cinnamon (39)	Cinnamon (39)
Rectrices	Rufous (± Brown)	Rufous (± Brown)	Rufous (± Brown)
Upper tail coverts	Rufous (340)	Rufous (340)	Rufous (340)
Back	Dark drab (119B)	Dark drab (119B)	Dark drab (119B)
Crown	Brown (119A)	Brown (119A)	Brown (119A)
Forehead	White ± stretch marks brown (221)	White ± stretch marks brown (221)	White ± stretch marks brown (221)
Superciliary line	White	White	White
Wing coverts	Rufous (340)	Rufous (340)	Rufous (340)
Remiges	Brown (221)	Brown (221)	Brown (221)

distribution of *S. stictothorax*, but it is also present in individuals of *S. chinchipensis*, with no indication of usefulness as diagnostic character between taxa (see Fig. 1B and Table 1).

Synallaxis hypochondriaca (Salvin, 1895)

Siptornis hypochondriacus Salvin, 1895: 14. Syntypes, by original designation: NHMUK 1899.6.1.573, adult male; NHMUK 1899.6.1.574, adult female; NHMUK 1899.6.1.579 adult female; AMNH 523869, adult female; from "Malea", Cajabamba, Peru (8,000 ft.), collected by O. T. Baron from 16 to 18 April 1894; and AMNH 523868 from Cajabamba, Peru (9,000 ft.) collected by O. T. Baron on April 2 1894. Lectotype, by present designation: AMNH 523869 (see Remark 4). Stephens & Traylor (1983) suggest that "Malea" is a variation of the locality Malca, Department of Cajamarca, Peru. Therefore, as previously mentioned by Cory & Hellmayr (1925), the correct reference is Malca and Cajabamba, Department of Cajamarca, Peru. The coordinates are 07°35′S, 78°09′W (Stephens & Traylor, 1983), with an altitude of nearly 2,500–3,000 m (8,000–9,000 ft.), according to Salvin (1895).

Diagnosis. *Synallaxis hypochondriaca* is diagnosable relative to *S. stictothorax* and *S. chinchipensis* by the colours white and umber (123) with brown spot-streaks (121 or 221) at the lower part of the sides of the body and flanks, while *S. stictothorax* presents the lower part of the sides of the body and flanks in cinnamon (39), and in *S. chinchipensis* the sides and flanks are white with brown spot-streaks (121 or 221). *Synallaxis hypochondriaca* is also distinguishable by its dark drab (119B) rectrices and upper tail coverts, versus the rufous rectrices (340 or 136) of *S. stictothorax* and *S. chinchipensis*, and by its dark drab forehead (119B), which is white with stretch marks brown (121 or 221) in *S. stictothorax* and cinnamon (39) and dark drab (119B) with stretch marks brown (121 or 221) in *S. chinchipensis*. *Synallaxis hypochondriaca* is still diagnosable relative to *S. stictothorax* by: bill length, which varies from 15.01 to 19.66 mm versus 10.35 to 12.77 mm in *S. stictothorax*; bill height, varying between 4.19 and 4.97 mm versus 2.82 to 3.52 mm in *S. stictothorax;* and wing length, varying between 60.47 and 68.57 mm, while *S. stictothorax* presents variation from 46.01 to 55.11 mm. *Synallaxis hypochondriaca* is still diagnosable relative to *S. chinchipensis* by: a white superciliary line versus the cinnamon (39) one of *S. chinchipensis*; bill height that varies from 4.19 to 4.97, while in *S. chinchipensis* it ranges from 3.16 and 3.81 mm; and by wing length varying from 60.47 to 68.57 mm in *S. hypochondriaca* and between 47.89 and 53.65 mm in *S. chinchipensis*. *Synallaxis hypochondriaca* is diagnosable relative to all other *Synallaxis* by the white breast with brown spot-streaks (121 or 221; see Figs 1 and 2, Tables 1 and 2).

Description. Throat and lateral throat white; white breast with greater or lesser presence of brown spot-streaks (varying between colours 121 and 221); white abdomen; sides of the body white and umber with greater or lesser presence of brown spot-streaks (varying between 121 and 221); flanks white and umber (123) without spot-streaks; six pairs of dark rufous rectrices (119B); in some individuals the vexilla are partially brown (221), giving a two-colour appearance for the rectrices; dark drab (119B) upper tail coverts; dark drab back (119B) with greater or lesser presence of the rufous (340); dark drab crown (varying between 119B and 119A); dark drab forehead (119B); white superciliary line; rufous (varying between 340 and 136) wing coverts; brown remiges (varying between 121 and 221). Bill length varying from 15.01 to 19.66 mm; bill height from 4.19 to 4.97 mm; wing length

from 60.47 to 68.57 mm; and tail length varying between 69.00 and 94.00 mm. No sexual dimorphism was detected regarding plumage colour, but in the morphometric data, the bill height, bill length, and wing length are smaller in females than in males (see Figs. 1 to 3, Tables 1 and 2). See Remark 5 for additional information.

Distribution. Northcentral Peru, upper Río Marañón valley in north Ancash, south Cajamarca, south-west Amazonas and La Libertad, between 2,000 and 2,800 meters elevation, restricted to the Marañón Valley as shows **Fig. 4**, according to Remsen (2003: 290) and Dickinson & Christidis (2014: 138).

Remark 4. The original description of *Synallaxis hypochondriaca* (Salvin, 1895) mentions male and female without details. During our analysis of the NHMUK and AMNH collections, we encountered five supposed syntypes, according to the information on their labels. The catalogue of types from NHMUK (Warren & Harrison, 1971) indicated two syntypes: NHMUK 1899.6.1.573, adult male; and NHMUK 1899.6.1.574, adult female. The catalogue of types of the AMNH (LeCroy & Sloss 2000) do not point out any type for *S. hypochondriaca* (Salvin, 1895), however LeCroy (2017, *in litt*.) informed us that the determination of those syntypes at AMNH preceded the publication of the referred catalogue. According to LeCroy (2017, *in litt*) the AMNH specimens should be regarded as syntypes, as well as those specimens housed at NHMUK, given the fact that Salvin (1895) wrote in his introductory pages that part of the material which has been collected by O. T. Baron in Peru had been sent to him (NHMUK specimens) and the other part (those indicated by asterisk in Salvin, 1895) to the Rothschild Museum (now the AMNH specimens). In addition to these four specimens recognized by their respective safeguard institutions as syntypes, during our studies at NHMUK we found at least one more specimen, NHMUK 1899.6.1.579, that should also be considered one of the syntypes following article 73.2.1. of the *Code*. This specimen is an adult female and, as the other two that are recognized as syntypes by Warren & Harrison (1971), was collected by O. T. Baron in Malea, Cajabamba, Peru on April 1894. There are also other four specimens of *S. hypochondriaca* that were collected by O. T. Baron, however, these specimens are from different localities of Peru (NHMUK 1899.6.1.575, Malea, Chusgon; NHMUK 1899.6.1.576, Sueca, Huamachuro; NHMUK 1899.6.1.577, Cajabamba; NHMUK 1899.6.1.578, Chusgon), collected on February 1895, instead of April 1894, and since the original description was published on February 1895, we did not consider them types. In this respect, considering the Remark 4 and the recommendations of the *Code*, here we designate the specimen AMNH 523869 as the lectotype of the nominal species *S. hypochondriaca* (Salvin, 1895) and state that the remaining specimens (NHMUK 1899.6.1.573, NHMUK 1899.6.1.574, NHMUK 1899.6.1.579, AMNH 523868) be considered from now on as its paralectotypes.

Remark 5. There is one specimen mentioned above, that deserves a special mention: NHMUK 1899.6.1.578, from Chusgon, Peru. According to Stephens & Traylor (1983), this specimen was collected at 2,593 m, 12 km from Sarin on Río Chusgon, left bank affluent of the Río Marañón, by O. T. Baron on 13 February 1895. It presents a plumage more similar to *S. chinchipensis* than to *S. hypochondriaca*, including the dark drab (119B) forehead with cinnamon (39) and brown spot-streaks, as well as a cinnamon (39) superciliary line. Nevertheless, it is not totally morphologically congruent with that species considering the presence of cinnamon (39) in the breast, while in *S. chinchipensis* it is white. The morphometric data are similar to those of *S. hypochondriaca* (bill length 17.17 mm, bill height 4.23 mm, wing length 63.58 mm, tail length 87.00 mm, and 12 rectrices; see Table 2). This specimen is under investigation. For the purposes of this study, it will be identified as a morphological variant of *S. hypochondriaca*, but in future analysis it may be shown to be more than a simple variation of the plumage.

Synallaxis chinchipensis Chapman, 1925

Synallaxis stictothorax chinchipensis Chapman, 1925: 8. Holotype, by original designation: AMNH 182062, adult male from Perico, Río Chinchipe, near the Marañón, Cajamarca, Peru, coordinates are 05°15′S, 78°45′W with an altitude of nearly 200 m (Stephens & Traylor, 1983; LeCroy & Sloss, 2000).

Diagnosis. *Synallaxis chinchipensis* is distinguishable from *S. stictothorax* and *S. hypochondriaca* by the lower part of the sides of the body and flanks white with brown (121 or 221) spot-streaks, while the lower part of the sides of the body and flanks are white and umber (123) with brown spot-streaks in *S. hypochondriaca*, and the lower part of the sides of the body and flanks are cinnamon (39) in *S. stictothorax*. *Synallaxis chinchipensis* also differs from *S. stictothorax* and *S. hypochondriaca* by its white and cinnamon (39) flanks with brown spot-streaks. The two other species present flanks that are cinnamon (39), and white and umber, respectively. *Synallaxis chinchipensis* is also distinguishable by its dark drab (119B) and cinnamon (39) forehead with brown spot-streaks (121 or 221), versus the white with brown spot-streaks (121 or 221) of *S. stictothorax*, and the dark drab (119B) forehead of *S. hypochondriaca*. *Synallaxis chinchipensis* presents a cinnamon (39) superciliary line, while in *S. stictothorax* and *S. hypochondriaca* it is white. *Synallaxis chinchipensis* is still diagnosable relative to *S. hypochondriaca* by its rufous rectrices and upper tail coverts, which are dark drab (119B) in *S. hypochondriaca*, and by its measurements: bill height varying from 3.16 to 3.81 mm, while in *S. hypochondriaca* it ranges from 4.19 to 4.97 mm; and wing length varying from 47.89 to 53.65 mm, while in *S. hypochondriaca* it varies from 60.47 to 68.57 mm. *Synallaxis chinchipensis* is diagnosable relative to all other *Synallaxis* by its white breast with brown spot-streaks (121 or 221; see Figs. 1 and 2, Tables 1 and 2).

Description. White throat; white lateral part of the throat, with cinnamon spot-streak (39) on some individual; white breast with greater or lesser presence of brown spot-streaks (colour varying between 121 and 221); white abdomen; side of the body white, with greater or lesser presence of brown spot-streaks (varying from 121 to 221); flanks white with cinnamon (39) invasion and brown spot-streaks (varying from 121 to 221); five pairs of rufous rectrices (varying from 340 to 136), and in some individuals the vexilla are partially brown (221), giving a two-colour appearance for those feathers; rufous (varying from 340 to 136) upper tail coverts; dark drab back (119B) with greater or lesser invasion of rufous (340); dark drab crown (varying from 119B to 119A); cinnamon (39) and dark drab (119B) forehead with few brown spot-streaks; cinnamon superciliary line (39); rufous wing coverts (colours varying between 340 and 136); brown remiges (varying from 121 to 221). Bill length varying from 12.15 to 15.84 mm; bill height from 3.16 to 3.81 mm; wing length varying from 47.89 to 53.65 mm; and tail length from 60.00 to 72.00 mm. No sexual dimorphism was detected regarding plumage colour, but morphometric data shows consistent differences among sexes, with smaller females overall (see Figs. 1 to 3, Tables 1 and 2).

Distributiom. Northwest Peru, River Chinchipe and middle Río Marañón valley in Cajamarca as shows Fig. 4, according to Remsen (2003: 289) and Dickinson & Christidis (2014: 139). It lives in "Arid lowland scrub, also deciduous woodland edge; mainly at 400–600 m." (del Hoyo *et al*., 2020).

Discussion

As mentioned previously, Derryberry *et al*. (2011) were the first to contribute to the elucidation of the intra- and interspecific relationships in the *S. stictothorax* species group from a phylogenetic perspective. In that study, *S. hypochondriaca* was included in the genus *Synallaxis*, as the sister group of the clade comprising *S. stictothorax* and *S. zimmeri*. After Derryberry *et al*. (2011), it became evident that the monotypic genus *Siptornopsis* should be considered synonymous with *Synallaxis*, as adopted by Ohlson *et al*. (2013). Tobias *et al*. (2014), repeated the analysis of Derryberry *et al*. (2011) adding *S. chinchipensis* and *S. s. maculata* to the dataset. The resulting topology included *S. stictothorax* and *S. s. maculata* as the sister clade of *S. zimmeri* and also indicated that *S. chinchipensis* was more closely related to *S. hypochondriaca* than to *S. stictothorax*. This relationship is better understood and represented now with the elevation of *S. chinchipensis* to species status, as indicated by our analysis of plumage colour and morphometry.

It should also be noted that a high degree of morphological variation was observed within the *S. stictothorax*, *S. hypochondriaca* and *S. chinchipensis*. Such a variation has, historically, caused much confusion, and resulted in the descriptions of the subspecies *S. s. maculata* Lawrence, 1874 and *S. s. piurae* Chapman, 1919, which were based on simple variations that correspond to usual fluctuations in plumage colour patterns, which occur in virtually all taxa, and do not correspond to diagnostic characters. These are particularly noticeable with respect to the lateral throat, with some individuals of *S. stictothorax* and *S. chinchipensis* presenting the cinnamon spot-streak, and with respect to the breast, sides of the body, and flanks, in which the shape of the spot-streaks is sometimes more elongated and sometimes more rounded (like macules), as well as variation in the number of spot-streaks. The spot-streaks of *S. stictothorax* and *S. chinchipensis* vary in amount, location, and tone of brown (121 and 221), as well as in relation to the presence of rufous tones (340 or 136). The back of *S. stictothorax*, *S. chinchipensis*, and *S. hypochondriaca* also vary in regards to the presence of rufous, and the crown varies depending on the presence of brown (119A). The forehead is also variable in *S. stictothorax* and *S. chinchipensis*, showing a greater or lesser presence of brown spot-streaks and varying in tone (121 or 221). Wing coverts vary in the kind of rufous (340 or 136), and remiges in the tone of brown (121 or 221).

Given their patterns of distribution and degree of overlap, most of these variations were interpreted by us as polymorphisms, without relation to geography, sexual dimorphism, or ontogeny, as variation was observed in specimens from the same locality (*e.g*. AMNH 129790 and AMNH 129791 from Guayaquil, Ecuador), in both male and female adults.

Finally, we call attention to the importance of continuing the revision of polytypic taxa in order to identify valid species, which are sometimes hidden at the subspecies level. Indeed, some subspecies that are commonly recognised as valid are clearly worthy of specific status; however, others may not even correspond to geographical variation. This was the case for *S. s. maculata*, which was not supported as a valid taxon by this study. However, *S. chinchipensis*, which was previously recognized as a subspecies of *S. stictothorax*, was diagnosed morphologically and classified as a close relative of *S. hypochondriaca*, according to a molecular analysis (Tobias *et al*., 2014). The precise distinction between subspecific taxa representing natural units and those that are the result of historical sample artefacts is of ultimate importance even today, as those entities will serve as the basis for all our efforts in conservation and for studies on biogeography, comparative anatomy, and others (Mayr, 1982; Cracraft, 1983; Wheeler *et al*., 2004; Peterson, 2006; Agnarsson & Kuntner, 2007; de Queiroz, 2007; Padial *et al*., 2010). The more careful and scientific the taxonomic reviews are, the more reliable will be any inference made from their conclusions.

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