

Artículo



DISTRIBUTION OF THE SPIX'S DISK-WINGED BAT, *Thyroptera tricolor* SPIX, 1823 (CHIROPTERA: THYROPTERIDAE) IN COLOMBIA, WITH FIRST RECORDS FOR THE MIDDLE MAGDALENA VALLEY

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ABSTRACT. *Thyroptera tricolor* is a rarely collected bat species that inhabits lowland forests in Central and South America. We review the distribution of *T. tricolor* in Colombia, using previous and new records deposited in scientific collections of the world, providing a distribution map and a gazetteer with comments on available geographical information. We also provide first records for the Middle Magdalena Valley, with external and cranial measurements. These new records reduce the distributional gap between northern and southern records of the country. Additionally, by comparing dental measurements of our recent specimens with fossil records of thyropterids from the Magdalena Valley (La Venta deposits), we contribute to understanding the evolution and distribution of this group, reinforcing the hypothesis of evolutionary stasis.

RESUMEN. Distribución del murciélago de ventosas de Spix, *Thyroptera tricolor* Spix, 1823 (Chiroptera: Thyropteridae) en Colombia, con nuevos registros para el valle del Magdalena Medio. *Thyroptera tricolor* es un murciélago rara vez colectado, que habita bosques de tierras bajas en Centro y Suramérica. Revisamos la distribución de *T. tricolor* en Colombia, utilizando registros previos y nuevos depositados en colecciones científicas del mundo, incluyendo un mapa de distribución y un directorio geográfico con comentarios sobre la información geográfica disponible. Proveemos los primeros registros para el valle del Magdalena Medio, con medidas externas y craneales. Los nuevos registros reducen la brecha de distribución entre el norte y el sur del país. Adicionalmente, mediante la comparación de mediciones dentales entre nuestros registros recientes y fósiles de thyroptéridos del valle del Magdalena (depósitos de La Venta), contribuimos a la comprensión de la evolución y distribución de este grupo, reforzando la hipótesis de estasis evolutiva.

Key words: New records. Lowland forest bat.

Palabras clave: Murciélago de bosques de tierras bajas. Nuevos registros.

INTRODUCTION

The disk-winged bats family (Chiroptera: Thyropteridae) comprise five species: *Thyroptera tricolor*, *T. discifera*, *T. lavalii*, *T. devivoi* and *T. wynneae*, the last two recently recognized (Gregorin et al., 2006; Velazco et al., 2014). These bats are characterized by the presence of circular adhesive disks on the sole of the foot and base of the thumb (Simmons, 1998), which they use to roost inside furled leaves of *Heliconia* (Heliconiaceae), *Musa* (Musaceae), *Calathea* (Marantaceae), *Phenakospermum* (Strelitziaceae) and dead leaves of *Musa*, *Cecropia* (Cecropiaceae) or palm fronds (Arecaceae) (Velazco et al., 2014).

Thyropterids inhabit lowland forests (Findley and Wilson, 1974) from southern Mexico to southeastern Brazil, being *T. tricolor* (Fig. 1) the most widely distributed species (Wilson, 2008); discontinuously in Central America from southern Mexico to Panama (not registered in El Salvador), and continuously in South America through Colombia, Venezuela, the Guianas, Trinidad, Ecuador, Peru, Bolivia and Brazil. Studies of this species have focused on ecology (Findley and Wilson, 1974; Vonhof and Fenton, 2004), ethology (Chaverri and Gillam, 2015), development (Wimsatt and Enders, 1980), functional morphology (Riskin and Fenton, 2001; Dechmann et al., 2006) and genetics (Vonhof et al., 2001; Buchalski et al., 2014). Even being considered the most commonly collected and studied thyropterid (Velazco et al., 2014), it presents a low capture incidence with conventional techniques for

chiropterans (Castaño-Salazar et al., 2004), as occurs with the remaining species of the group. This would be the principal cause of lacking information on distribution, natural history, and phylogenetic relationships of the group (Solari et al., 2004). In this report, we review previous and new collection records of *T. tricolor* for Colombia, a country with low scientific records for many mammal species (Gardner, 2008; Patton et al., 2015), including comments on geographical information available at present. We also report the first records for the Middle Magdalena Valley (Santander and Antioquia) with external and cranial measurements, plus dental measurement comparisons with unique fossils recorded for the group, coming from the same valley (La Venta deposits, Czaplewski et al., 2003).

MATERIALS AND METHODS

All known records of *T. tricolor* for Colombia were obtained by comprehensive revision of the literature published on the species, data bases of the Global Biodiversity Information Facility (GBIF), Mammal Networked Information System (MaNIS), Sistema de Información sobre Biodiversidad de Colombia (SIB) (data sets including records from the American Museum of Natural History, AMNH; Field Museum of Natural History, FMNH; United States National Museum, USNM; Instituto Alexander von Humboldt, IAvH) and the information directly



Fig. 1. Adult female and juvenile male of *Thyroptera tricolor* from Barrancabermeja, Santander, part of the new records for the Middle Magdalena Valley (A). Detail of the wing circular disk of the adult female (B).

provided by most scientific collections of mammals in Colombia: Colección Mastozoológica del Chocó (CMCH), Colección de Mamíferos Alberto Cadena García at the Instituto de Ciencias Naturales (ICN), Museo de Historia Natural-Universidad Industrial de Santander (MHN-UIS), Museo Javeriano de Historia Natural Lorenzo Uribe (MPUJ-MAMM), Universidad del Valle-Vertebrados Mamíferos (UV), Colección de Mastozología Universidad del Quindío (CMUQ), Museo de Ciencias Universidad El Bosque (MCUB), Colección Teriológica Universidad de Antioquia (CTUA) and Museo de Historia Natural Universidad de La Salle (MLS), as well as specimens analyzed from new collects in inclusion process by scientific collections (ICN and CTUA). We offer a gazetteer and a map with all known records of *T. tricolor* for Colombia (**Appendix 1 [Supplementary Material]**; **Fig. 2**), excluding records without voucher evidence, and records with no geographical coordinates and locality registered. Each locality available was checked in order to identify any ambiguous information, mistakes, and lack of information. When geographical coordinates or part of the locality was not available, they were inferred from other gazetteers (Lemke et al., 1982; Botero et al., 2005; Gardner, 2008; Ramírez-Chaves, 2011; Saavedra-Rodríguez and Rojas-Díaz, 2011; Velazco et al., 2014) or from the locality information available using point-radius method (Wieczorek and Hijmans, 2004; Escobar et al., 2014) through the software QGIS 2.8.2 (accessed on 05/09/2015; QGIS

Project, 2015), generating geographical coordinates with limited accuracy, measured by an uncertainty range in meters.

New records of *T. tricolor* reported for Colombia were deposited at ICN and CTUA collections, providing geographical information, kind of preparation, collector name, collection date (**Appendix 1 [Supplementary Material]**), ecological data (**Table 1**), as well as external and cranial measurements (**Table 2**). For measurements and identification of specimens we followed Velazco et al., (2014). Dental measurement comparisons with fossil records of thyropterids from the Magdalena Valley (La Venta deposits; Czaplewski, 1996, 1997; Czaplewski et al., 2003) deposited at Instituto Nacional de Investigaciones Geológico-Mineras, Bogotá, Colombia (IGM) were obtained using ImageJ software (Schneider et al., 2012) (**Table 3**).

RESULTS

We compiled 89 records (80 previous and 9 new), distributed along 37 localities of the 5 natural regions of Colombia, in lowland and subandean forests with altitudes since sea level to approximately 1800 meters (**Table 1**; **Appendix 1 [Supplementary Material]**). Just two records were found from our literature revision: MHNUC 381 (Museo de Historia Natural Universidad de Caldas) from Caldas

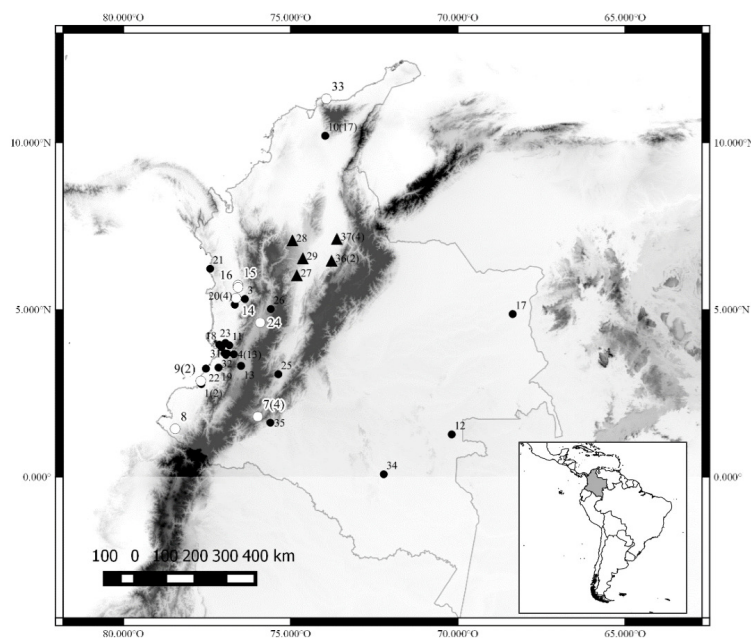


Fig. 2. Distribution map of *Thyroptera tricolor* for Colombia based on collection records, showing localities previously reported with geographic coordinates associated (empty circles), localities previously reported with coordinates inferred in this study from locality information registered (filled circles) and new records (first for Antioquia and Santander, also including first for the Middle Magdalena Valley; filled triangles). Numbers indicate the locality registered in the gazetteer provided, and numbers in parentheses indicate the amount of records associated with those localities (see **Appendix 1 [Supplementary Material]**).

Table 1

Ecological information associated with *Thyroptera tricolor* new collection records from Colombia.

ID.	Locality	Elevation (m)	Sex	Reproductive status	Capture method	Roosting place	Capture site
ICN (NR44)	Santander, Landazuri, vereda Rio Blanco, Finca Proyecto Minero Rio Blanco, valle del Magdalena Medio.	391	♀	nursing (Adult)	By hand	<i>Heliconia</i> sp	Gallery forest highly inter-vened beside a paddock
ICN (NR45)	Santander, Landazuri, vereda Rio Blanco, Finca Proyecto Minero Rio Blanco, valle del Magdalena Medio.	391	♂	Inactive (juvenile)	By hand	<i>Heliconia</i> sp	Gallery forest highly inter-vened beside a paddock
ICN (JLF105)	Santander, Barranca-bermeja, corregimien-to el Centro, vereda Campo 45, valle del Magdalena Medio.	73	♂	Inactive (Adult)	By hand	<i>Heliconia</i> sp	Agro-ecosystem
ICN (JLF106)	Santander, Barranca-bermeja, corregimien-to el Centro, vereda Campo 45, valle del Magdalena Medio.	98	♀	nursing (Adult)	By hand	<i>Calathea</i> sp	Agro-ecosystem
ICN (JLF107)	Santander, Barranca-bermeja, corregimien-to el Centro, vereda Campo 45, valle del Magdalena Medio.	98	♀	Inactive (Adult)	By hand	<i>Calathea</i> sp	Agro-ecosys-tem
ICN (JLF108)	Santander, Barranca-bermeja, corregimien-to el Centro, vereda Campo 45, valle del Magdalena Medio.	98	♂	Inactive (juvenile)	By hand	<i>Calathea</i> sp	Agro-ecosystem
CTUA 2862	Antioquia, Amalfi, El Jardín	1500	♀	Unknown	Un-known	Unknown	No details
CTUA 2863	Antioquia, San Luis, El Prodigio, Las Confusas, valle del Magdalena Medio.	320	♂	Unknown	Netting	Unknown	No details
CTUA 2864	Antioquia, Maceo, Hacienda Santa Barbara, valle del Magdalena Medio.	550	♀	Inactive (Adult)	Netting	Unknown	Secondary growth tropi-cal forest

Table 2

External and cranial measurements (mm) and weights (g) of *Thyroptera tricolor* new records from Colombia (Total length, TL; Ear, E; Forearm, FA; Tail, T; Hindfoot, H, Weight, W; Greatest length of skull, GLS; Condylolincisive length, CIL; Braincase breadth, BB; Rostral length, ROL; Zygomatic breadth, ZB; Postorbital breadth, PB; Maxillary tooththrow length, MTRL; Width at M3, M3–M3; Length of mandible, LMA; Mandibular tooththrow length, MANDL). Juveniles were excluded. Measurements taken from Velazco et al (2014) indicates: mean, observed range (in parentheses), and sample size. * indicates values that fall out of the ones reported by Velazco et al. (2014) for the species.

Measurement	♀CTUA 2862	♂CTUA 2863	♀CTUA 2864	ICN (♀NR44)	ICN (♂JLF105)	ICN (♀JLF106)	ICN (♀JLF107)	Velazco et al. (2014) Females	Velazco et al. (2014) Males
Total length (TL)	-	74	76	44.1*	63.6*	67.5*	67.9*	72.9 (68–79) 16	71.9 (67–77) 12
Ear (E)	-	-	12	12.3	12.0	12.5	13.4*	12.3 (11–13) 8	12.4 (11–13) 7
Forearm (FA)	35.9	37	37	36	35.6	36.8	35.9	37.1 (35–39) 27	36.7 (33.5–40.0) 18
Tail (T)	-	34*	29	27.8	24.8*	27.7	25.6	27.3 (25–30) 18	28.6 (25–30) 12
Hindfoot (H)	-	-	10*	6.1*	5.8	5.2	5.1	5.7 (4–6) 18	5.9 (4–7) 10
Weight (W)	-	-	4.5	-	-	5.0	5.0	4.5 (3.5–5.1) 12	4.4 (3.4–5.1) 11
Greatest length of skull (GLS)	14.1	14.3	13.9	-	14.6	15.1	14.8	14.6 (13.6–15.5) 24	14.3 (13.8–15.7) 18
Condylolincisive length (CIL)	13.4	13.4	13.6	-	13.3	13.9	13.5	13.7 (12.9–14.3) 24	13.5 (12.9–14.4) 18
Braincase breadth (BB)	7.3	7.2	7.2	-	7.4	7.3	7.4	7.3 (6.7–7.6) 24	7.3 (6.9–7.5) 17
Rostral length (ROL)	-	-	-	-	5.1	5.7*	5.4	5.3, 5.5	-
Zygomatic breadth (ZB)	-	-	7.5	-	6.8*	7.1	7.2	7.5 (6.9–7.7) 13	7.4 (7.1–7.7) 10
Postorbital breadth (PB)	2.7	2.8	2.8	-	2.8	2.9*	2.9*	2.7 (2.5–2.8) 25	2.7 (2.6–2.8) 17
Maxillary tooththrow length (MTRL)	5.9	5.7	5.9	-	5.7	5.9	5.7	5.9 (5.5–6.2) 25	5.9 (5.6–6.3) 18
Width at M3 (M3–M3)	5.3	5.1	5.2	-	5.3	5.3	5.5	5.2 (4.8–5.5) 25	5.2 (5.0–5.5) 18
Length of mandible (LMA)	10.3	10.5	10.5	-	10.3	11.3	11.0	10.6 (9.7–11.3) 23	10.4 (9.6–10.7) 15
Mandibular tooththrow length (MANDL)	5.9	5.4*	5.9	-	6.0	6.7*	6.2	6.2 (5.7–6.5) 25	6.1 (5.8–6.3) 15

Table 3

Dental measurement (mm) comparisons of *Thyroptera tricolor* new records from the m Middle Magdalena Valley with fossil records of thyropterids from La Venta deposits (Magdalena Valley). Juveniles were excluded. When fossil measurements have more than one value in each measure, they correspond to different teeth vouchers (see Czaplewski, 1996; 1997; Czaplewski et al., 2003). Acronyms: Colección Teriológica Universidad de Antioquia (CTUA) and Colección de Mamíferos Alberto Cadena García at the Instituto de Ciencias Naturales (ICN).

Measurements	<i>Thyroptera cf. lavalii</i> (Czaplewski, 1996)	<i>Thyroptera cf. tricolor</i> (Czaplewski, 1997)	<i>Thyroptera cf. lavalii</i> (Czaplewski et al., 2003)	♀CTUA 2862	♂CTUA 2863	♀CTUA 2864	ICN (♂JLF105)	ICN (♀JLF106)	ICN (♀JLF107)
C1 labial length	0.98	0.77	-	0.81	0.80	0.79	0.70	0.76	0.76
C1 transverse width	0.71	0.60	0.75	0.61	0.57	0.55	0.59	0.64	0.59
C1 anteroposterior length	-	-	0.95	-	-	-	0.70	0.76	0.76
P4 labial length	-	0.94; 0.92	-	0.96	0.90	0.88	0.65	0.72	0.85
P4 transverse width	-	0.94; 0.87	-	0.95	0.96	0.92	0.82	0.99	0.74
M1 labial length	1.38	1.17; 1.22	1.55	1.35	1.25	1.29	1.09	1.17	1.17
M1 lingual length	1.09	0.92; 1.05	1.25; 1.10	0.89	0.95	0.83	0.64	0.95	0.70
M1 transverse width	1.71	1.45; 1.35	1.65	1.34	1.29	1.21	1.05	1.32	1.06
M2 labial length	1.48	1.23; 1.21	-	1.40	1.30	1.22	1.17	1.12	1.19
M2 lingual length	1.04	0.80	1.10	0.84	0.75	0.65	0.53	0.77	0.51
M2 transverse width	1.94	1.62	-	1.48	1.43	1.51	1.20	1.36	1.15
M3 labial length	-	0.95	-	-	-	-	0.25	0.61	0.36
M3 lingual length	-	0.57	-	0.79	0.76	0.72	0.58	0.75	0.65
M3 transverse width	-	1.41	-	1.65	1.49	1.43	1.21	1.59	1.29
p3 anteroposterior length	-	0.91	-	0.77	0.72	0.82	0.69	0.78	0.67
p3 trigonid width	-	0.51	-	0.46	0.44	0.45	0.56	0.50	0.50
p4 anteroposterior length	-	0.91	-	0.84	0.73	0.73	0.70	0.75	0.70
p4 trigonid width	-	0.51	-	0.47	0.49	0.46	0.57	0.52	0.51

(Table 3 cont.)

Measurements	<i>Thyroptera cf. lavalii</i> (Czaplewski, 1996)	<i>Thyroptera cf. tricolor</i> (Czaplewski, 1997)	<i>Thyroptera cf. lavalii</i> (Czaplewski et al., 2003)	♀CTUA 2862	♂CTUA 2863	♀CTUA 2864	ICN (♂JLF105)	ICN (♀JLF106)	ICN (♀JLF107)
m1 anteroposterior length	-	-	1.20	1.15	1.16	1.12	1.09	1.25	0.99
m1 trigonid width	-	-	0.75	0.59	0.53	0.53	0.52	0.51	0.51
m1 talonid width	0.85	-	0.80; 0.90	0.72	0.68	0.69	0.54	0.72	0.70
m2 anteroposterior length	-	-	1.25	1.27	1.35	1.37	1.14	1.11	1.00
m2 trigonid width	-	-	0.75	0.66	0.61	0.61	0.54	0.62	0.63
m2 talonid width	0.85	-	0.80; 0.90	0.77	0.72	0.76	0.60	0.73	0.72
m3 talonid width	-	-	0.70	0.55	0.53	0.54	0.63	0.57	0.52

Department (Castaño-Salazar et al., 2004) and MPUJ-MAMM 1216 from Quindío Department (Pérez-Torres and Cortés-Delgado, 2009). However, the last record was corrected as *T. lavalii* by S. Solari, and has been excluded from this report. The collections of this species in Colombia started in 1910 decade (with two collects), reached its peak in the 1970 decade (with 34 collects), and since 2003 until 2015 increased in just 13 specimens (**Appendix 1 [Supplementary Material]**). Twenty one records presented some ambiguous information that was corroborated, 55 were lacking information that was supplemented (10 cases corresponding to geographical coordinates inferred from locality, 40 geographical coordinates inferred from literature, 5 localities inferred from geographical coordinates), and 18 presented some wrong information that was corrected (**Appendix 1 [Supplementary Material]**).

Six out of the nine new records provided for Colombia were first ones for Santander, and the remaining three for Antioquia. Eight of them were first records for the Middle Magdalena Valley (**Fig. 2; Table 1**). Records from Santander were captured by hand from its roosting place; a juvenile male from Landazuri municipality was captured in February 2015 inside a furled leaf of *Heliconia* (Heliconiaceae), within a patch of gallery forest highly intervened beside a paddock. Few minutes later, in the same place, an adult female flew intentionally to roost over the carry bag in which the juvenile was stored, being also captured (**Table 1**). All individuals from Barrancabermeja municipality (three adults, one juvenile) were captured by hand in July 2015 next to a highly traveled road, in an agro-ecosystem within a patch of secondary forest highly intervened, inside furled leaves of *Heliconia* and *Calathea* (Marantaceae) (**Fig. 1; Table 1**). The individuals from Antioquia were captured in 1993, 1996 and 2008, but only now, with our work, they were catalogued into a scientific collection (CTUA) (**Table 1**). We lack precise field data (locality and date) for specimens from 1993 and 1996, but we have information for the specimen collected in 2008. This adult female was netted within a secondary growth

tropical forest, near to the Alicante River in Maceo municipality, on May (**Table 1**).

External and cranial measurements of our recent *T. tricolor* records for Colombia showed slight differences regarding measurements reported by Velazco et al. (2014) for the species (**Table 2**). Dental measurement comparisons with fossils showed that recent records of *T. tricolor* specimens have smaller teeth dimensions by about 3.75% to 40.72% (m2 talonid width and M2 transverse width, respectively) regarding *T. cf. lavalii* fossils (Czaplewski, 1996; Czaplewski et al., 2003); nevertheless, they have larger anteroposterior length of the m1 and m2 by about 4.17% to 9.60% (**Table 3**). On the other hand, similar comparisons of our *T. tricolor* specimens regarding *T. cf. tricolor* fossils (Czaplewski, 1997) showed that dental dimensions of current specimens closely match or slightly exceed those of fossil ones (**Table 3**).

DISCUSSION

According to Galindo-González (2004), *T. tricolor* is sensitive to habitat disturbance, principally because of its highly specialized diet and habitat requirements. However, this author also recognized that the species inhabits secondary forests and agro-ecosystems. The latter agrees with our findings and those of Findley and Wilson (1974) and Boada et al. (2010). While recognizing the likely sensitivity of this species to specialized roosting places availability (Vonhof and Fenton, 2004), in our study, this was observed in plant populations of *Heliconia* and *Calathea* located in disturbed and fragmented patches of agro-ecosystems, and gallery forests with recurrent human activities, supporting the fact that this species is tolerant to highly disturbed habitats. Compiled records for Colombia show the presence of the species in subandean forests, between 1000 and 1818 meters (**Table 1**; **Appendix 1** [**Supplementary Material**]), contrasting with the typical lowland distribution (Findley and Wilson, 1974). Previous data on reproductive activity of *T. tricolor* shows pregnant females in Costa Rica during August (Costa Rica; Findley and Wilson, 1974), while in Peru (Ascorra et al., 1996) and Bolivia (Anderson and Webster,

1983) pregnant females were observed from September to November (those from Bolivia coupled with adult females nursing neonates); however, in Nicaragua females were inactive in November (Medina-Fitoria et al., 2015), and a reproductive male was observed in April (Medina-Fitoria, com pers.). This information, along with ours, suggests that this species may reproduce throughout the year; we found two adult females with juveniles in February and July (**Table 1**), but more evidence is needed to understand its reproductive cycles. Specific echolocation calls are recognized for *T. tricolor*, allowing group and strong individual recognition (Chaverri and Gillam, 2015). This behavior could be in agreement with the one registered for the adult female collected in Landazuri municipality (Santander; **Table 1**), which flew to roost over a carry bag containing a juvenile captured few minutes earlier.

New records of *T. tricolor* for Colombia extend the known distribution of this species in the country, previously restricted to the northernmost and the southern portions, providing continuity and filling the northern portion of the Andean region at the Middle Magdalena Valley (Santander and Antioquia; **Fig. 2**). Minor differences found between measures of the new records for Colombia (from the Middle Magdalena Valley) and those reported by Velazco et al. (2014) for the species (**Table 2**) could be interesting. The whole Magdalena Valley is recognized as a complex biogeographic area, where at least six areas of endemism of mammals overlap its boundaries (Noguera-Urbano and Escalante, 2015). Also, the Middle Magdalena Valley is proposed as part of the Nechí-San Lucas refuge, a humid biological refuge during the Pleistocene. Uprising of the Andean cordilleras, initiated during the Cretaceous and completed during the Pliocene and latter Pleistocene, formed three cordilleras and their inter-andean valleys in Colombia, allowing emergence of new environments relatively isolated from others and generating a direct impact on evolution of fauna and flora (Hernández-Camacho et al., 1992). New records of *T. tricolor* from the Middle Magdalena Valley provide valuable material for the understanding of the evolution

and distribution of disk-winged bats, through comparisons with fossil records of thyropterids from La Venta (Magdalena Valley), a deposit from the Miocene, just before the Andean cordilleras were completely formed (approximately 12.5 million years ago, Czaplewski, 1996; Czaplewski, 1997; Czaplewski et al., 2003; **Table 3**). These fossils are unique for the family, but their taxonomic affinities are not clearly resolved (Velazco et al., 2014). Dental comparison between new *T. tricolor* specimens with *T. cf. tricolor* fossils was consistent with those reported by Czaplewski et al., (2003), showing no significant differences between *T. cf. tricolor* fossils and current *T. tricolor* specimens (not reaching 0.5 mm difference in any instance; **Table 3**). This finding reinforces the possible presence of evolutionary stasis (at least in dental dimensions). Additionally, comparisons of new *T. tricolor* specimens with *T. cf. lavalii* fossils was consistent with that reported by Czaplewski (1996; 1997), showing fossils dental dimensions considerably bigger than current *T. tricolor* specimens. Nevertheless, our report also shows that the anteroposterior dimensions of m1 and m2 teeth are bigger in current *T. tricolor* specimens than in *T. cf. lavalii* fossils (**Table 3**). In general, the dental dimension with bigger variation between current *T. tricolor* specimens and thyropterid fossils (*T. cf. tricolor* and *T. cf. lavalii*) is the M2 transverse width.

The review of previous and new records of *T. tricolor* for Colombia reveals a low amount of specimens in scientific collections (89 records). This not necessarily means the species is uncommon (Vonhof and Fenton, 2004), but shows that it is poorly captured with conventional techniques for chiropterans, maybe due to its life history (Castaño-Salazar et al., 2004). Most records of this species in Colombia come from the Pacific coasts region (56.18%), followed by the Caribbean coast and the Andean regions (20.22% each), being concentrated in scientific collections out of Colombia (61.80%), principally collected between 1942 and 1975 (65.43%; excluding eight records without collection date; **Appendix 1 [Supplementary Material]**). This summary urges for an increasing collection of specimens in subsampled regions, to be deposited at local scientific collections, facili-

tating its physical revision by local researchers. Comprehensive revision of localities registered, correcting and complimenting them, and providing geographical coordinates, constitute a goal of this report, supplying a more accurate idea of previous and current known distribution of *T. tricolor* in Colombia (**Fig. 2**). Recent taxonomic arrangements in genus *Thyroptera*, associated with increased collections in some countries (Velazco et al., 2014), reveal the importance of scientific collections for species whose taxonomy and distribution are poorly known.

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SUPPLEMENTARY MATERIAL ONLINE

Appendix 1. Compiled records of *Thyroptera tricolor* for Colombia. The documented geographical coordinates or altitude marked with asterisk (*) correspond to values previously inferred by scientific collection possessing voucher specimen associated to such information, but not to a real value recorded by the collector.

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