



## Short Communication

# First records of *Anolis ventrimaculatus* Boulenger, 1911 (Squamata: Iguanidae) in Ecuador

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**Abstract.**—We report the first records of *Anolis ventrimaculatus* for Ecuador based on twelve specimens from three localities: Chical (Provincia Carchi), El Cristal (Provincia Esmeraldas), and Lita (Provincia Imbabura). The locality in the Provincia Carchi lies approximately 16 km S from the nearest record (Ñambí, Department Nariño, Colombia). We also present information on scalation and coloration.

**Key words.** Anole lizards, color, distribution, Ecuador, scalation

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Thirty-seven species of *Anolis* have been reported formally from Ecuador (Ayala-Varela et al. 2014). *Anolis ventrimaculatus* Boulenger 1911 was described from two syntypes, an adult female and a juvenile from Río San Juan, Department Risaralda, Colombia. Williams and Duellman (1984) designated the adult female syntype (BMNH 1946.8.13.5) as the lectotype.

*Anolis ventrimaculatus* is assigned to the *aequatorialis* series Castañeda and de Queiroz (2013) by having a moderate to large body size, narrow toe lamellae, small head scales, smooth ventral scales, and uniform dorsal scalation. It is assigned to the *eulaemus*-subgroup based on a typical *Anolis* digit, in which the distal lamellae of phalanx III distinctly overlap the first proximal subdigital scale of phalanx II (Williams 1976; Williams and Duellman 1984; Castañeda and de Queiroz 2013).

Eleven species of the *eulaemus*-subgroup occur on both sides of the Andes (*Anolis anoriensis* Velasco et al. 2010, *A. antioquiae* Williams 1985, *A. eulaemus* Bou-

lenger 1908, *A. fitchi* Williams and Duellman 1984, *A. gemmosus* O'Shaughnessy 1875, *A. maculigula* Williams 1984, *A. megalopithecus* Rueda-Almonacid 1989, *A. otongae* Ayala-Varela and Velasco 2010, *A. podocarpus* Ayala-Varela and Torres-Carvajal 2010, *A. poei* Ayala-Varela et al. 2014, and *A. ventrimaculatus* Boulenger 1911).

Specimens examined for comparisons are housed in the herpetological collections of the Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito, Ecuador (QCAZ); Museo de Herpetología de la Universidad de Antioquia, Antioquia, Colombia (MHUA); Colección de Herpetología, Universidad del Valle, Santiago de Cali, Colombia (UVC); and Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia (ICN). External character terminology follows Williams et al. (1995) and Poe and Yañez-Miranda (2008). Lamellar number was counted using the method of Williams et al. (1995), i.e., only on phalanges III and IV of the

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fourth toe. Measurements were made with digital calipers on preserved specimens and are given in millimeters (mm), usually to the nearest 0.1 mm. Snout-vent length (SVL) was measured from tip of snout to anterior edge of cloaca. Femoral length was measured from midline of venter to knee, with limb bent at a 90-degree angle. Tail length was measured from anterior edge of cloaca to distal point.

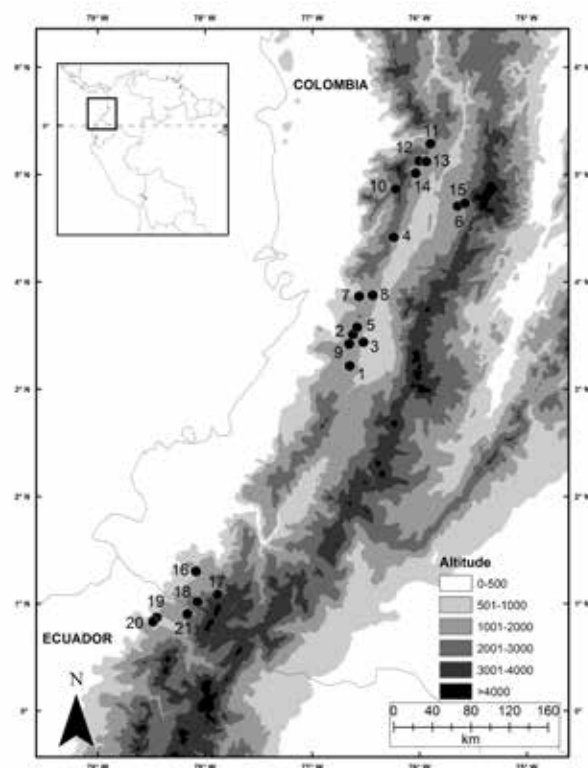
Herein we report the first records of *Anolis ventrimaculatus* (Fig. 1) for Ecuador based on specimens collected at three localities. Four specimens (QCAZ 3284–3286, 8934) were collected on 16 September 1992 in Lita (0.87°, -78.45°), Provincia Imbabura; four specimens (QCAZ 2666, 3923, 3924, 3929) were collected on August 1994 in El Cristal (0.83°, -78.49°, 1,200–1,250 m), Reserva Ecológica Cotacachi-Cayapas, Provincia Esmeraldas; and four specimens (QCAZ 4376, 4378, 4389, 4390) were collected on 03 July 2011 in Río San Pablo, near Chical (0.90°, -78.16°, 1,399–1,451 m), Provincia Carchi. The last locality lies approximately 16 km S from the nearest record (ICN 11981-85, 11987-989, 12097, Ñambí, Barbacoas municipality, Department Nariño, Colombia) (Fig. 1, Table 1).

The individuals from Chical (Provincia Carchi) were captured in secondary forest; all individuals were found on leaves, branches, or ferns from 50–150 cm above ground; a male were found head-down, while two females were found head-down and head-up. The smallest specimen (QCAZ 8934, juvenile, SVL = 31.4 mm) was collected on 16 September 1992. An adult female (QCAZ 4378) collected in July 2011 deposited one white egg (17.11 mm × 6.44 mm). Our collections of *Anolis ventrimaculatus* in Ecuador were found from 1,200 to 1,451 m above sea level. In Ecuador, this species occurs in sympatry with *A. aequatorialis*, *A. gemmosus*, and *A. maculiventris* in Chical (Provincia Carchi); with *A. lynchi*, *A. maculiventris*, and *A. princeps* (pers. obs. Sebastián Valverde) in Lita (Provincia Imbabura), and with *A. lynchi* in El Cristal (Provincia Esmeraldas).

Scalation and morphometric characters of *Anolis ventrimaculatus* are presented in Table 2. Scale counts are similar between Ecuadorian and Colombian specimens. Our Ecuadorian specimens of *Anolis ventrimaculatus* are smaller than those from Colombia (maximum SVL 62 mm and 80 mm, respectively).

Coloration in life of specimens from Ecuador was recorded as follows:

Adult female (QCAZ 4390, Figs. 2 A, B): dorsal surfaces of head, body and tail dark brown; dorsal surface of body with a pale brown longitudinal stripe extending from occipital region to base of tail; limbs pale brown with dark brown reticulation; tail pale brown; lateral surface of head with two stripes, one dark brown and extending posteriorly from loreal region, through subocular region, above tympanum to level of the hind limb, the other stripe is pale green and extending posteriorly from loreal region, through subocular region, above tym-



**Fig. 1.** Distribution of *Anolis ventrimaculatus* in South America (locality numbers are listed in Table 1).

panum to level of neck; lateral surface of body brown anteriorly and olive-green near inguinal region; ventral surface of head yellowish green with pale brown reticulations; ventral surface of body cream; ventral surface of limbs dark cream with dark brown reticulations; ventral surface of tail dark cream.

Adult female QCAZ 4378 (Figs. 2 C, D) differs from the previous pattern in having the dorsal surface of body brown, with seven dark brown blotches arranged longitudinally along the midline.

Adult male (QCAZ 4389, Figs. 2 E, F, G): When stressed, the background of head, body, limbs and tail was yellowish brown; dorsal surface of the neck with two dark brown bands; dorsal surface of body with nine dark brown blotches arranged longitudinally; limbs with dark brown bands; dorsal surface of tail with dark brown transversal bands, and with three dark brown blotches in the proximal part of tail; lateral surface of head with a darker brown first stripe, extending posteriorly from loreal region, through subocular region, above the tympanum and bifurcating into branches that continue on nuchal crest and shoulder, respectively; a yellowish-green second stripe, extending posteriorly from loreal region, through subocular region, above the tympanum to the shoulder; black ocelli with white centers on the shoulder; lateral surface of body with reddish-brown bands oriented ventroposteriorly; ventral surface of head yellowish green with pale brown reticulations; ventral surface of neck pale green; ventral surface of body cream; ventral surface of limbs pale brown with dark brown re-

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**Table 1.** Localities of *Anolis ventrimaculatus* in Ecuador and Colombia.

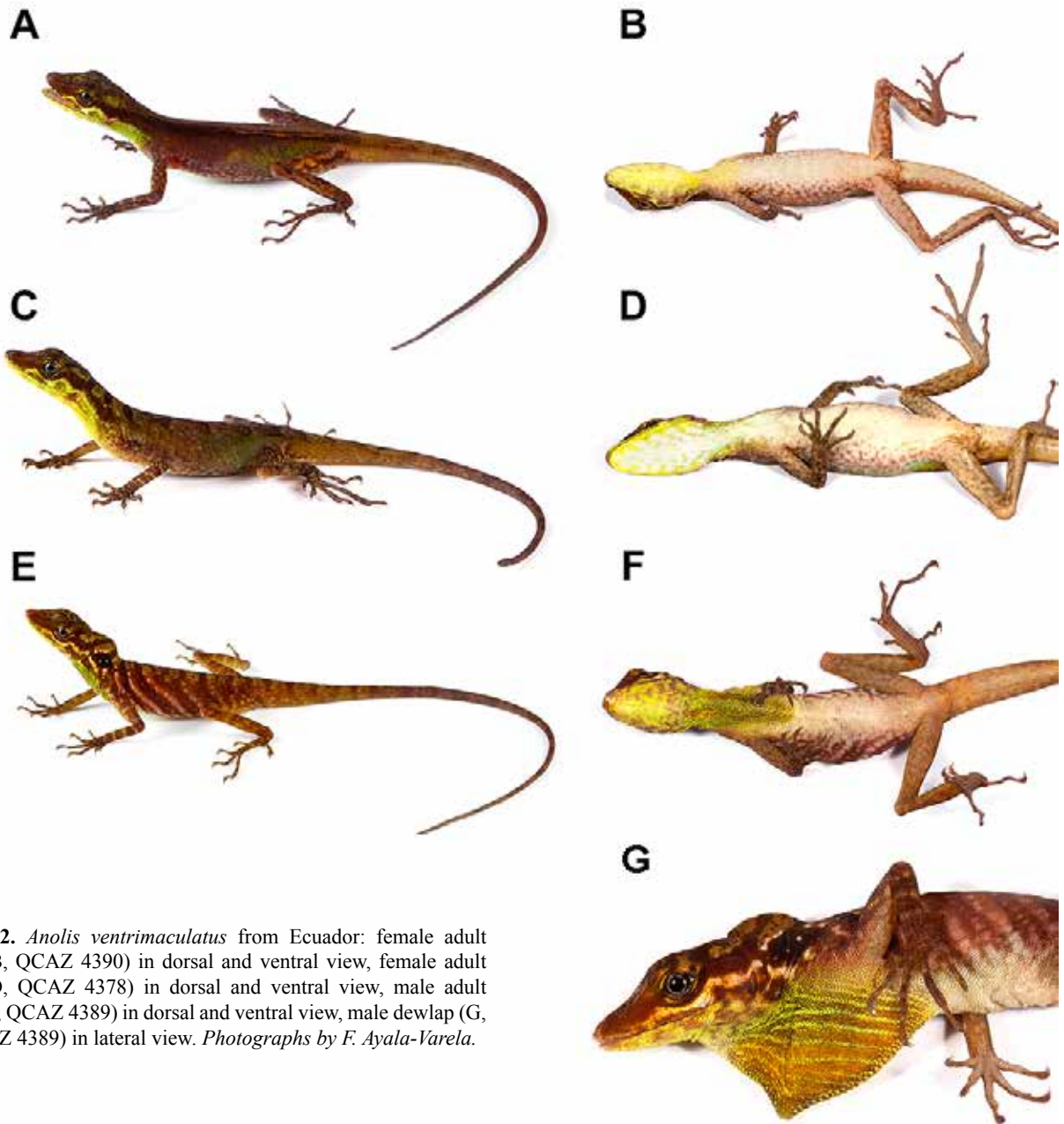
Site number	Country	Locality	Latitude	Longitude	Source
1	Colombia	Bosque de San Antonio, km 18 vía Cali-Buenaventura, Valle del Cauca	3.22	-76.65	JAV pers. obs
2	Colombia	Bosque de San Antonio, km 18 vía Cali-Buenaventura, Valle del Cauca	3.51	-76.62	UVC 9737, 9749, 9896, MHUA 1671-79, JAV pers. obs.
3	Colombia	Antena, Cerro La Horqueta, ca. 28 km de Cali, Valle del Cauca	3.44	-76.52	JAV pers. Obs, ICN 3567
4	Colombia	Vereda La Tulia, Mpio. Bolívar, Valle del Cauca	4.42	-76.24	JAV pers. obs
5	Colombia	Vereda Chicoral, La Cumbre, Valle del Cauca	3.58	-76.58	JAV pers. obs, UVC 10223
6	Colombia	PRN Barbas-Bremen, Mpio. Filandia, Quindío	4.71	-75.64	JAV pers. obs
7	Colombia	Alrededores Lago Calima, Mpio. Darien, Valle del Cauca	3.86	-76.56	JAV pers. obs; UVC 5189-96, ICN 3553-54
8	Colombia	Reserva Faunística Bosque de Yotoco, Valle del Cauca	3.88	-76.44	JAV pers. obs
9	Colombia	Peñas Blancas, Pichindé, Valle del Cauca	3.42	-76.66	UVC 223, 224
10	Colombia	Alto de Galápagos, carretera Cartago-San José del Palmar, Límite Valle-Chocó	4.86	-76.22	UVC 9366, UVC 8489-95
11	Colombia	PMN Arrayanal, Mpio. Apia, Risaralda	5.29	-75.90	JAV pers. obs
12	Colombia	PMN Planes de San Rafael, Mpio. Santuario, Risaralda	5.13	-76.00	JAV pers. obs
13	Colombia	PMN Agualinda, Mpio. Mistrató, Risaralda	5.12	-75.94	JAV pers. obs
14	Colombia	PMN Verdum, vereda La Secreta, Risaralda	5.01	-76.03	JAV pers. obs
15	Colombia	Vereda Buenos Aires, Cuenca Rio Barbo, Pereira, Risaralda	4.73	-75.58	JAV pers. obs
16	Colombia	Rio Ñambi, Nariño	1.30	-78.08	JAV pers. obs
17	Colombia	Reserva La Planada, Nariño	1.08	-77.88	JAV pers. obs
18	Colombia	Ñambi, Nariño	1.02	-78.07	ICN 11981-85, 11987-889, 12097
19	Ecuador	Lita, Imbabura	0.87	-78.45	QCAZ
20	Ecuador	El Cristal, Reserva Ecológica Cotacachi Cayapas, Esmeraldas	0.83	-78.49	QCAZ
21	Ecuador	Río San Pablo, cerca de Chical, Carchi	0.90	-78.16	QCAZ

ticolations; ventral surface of tail pale brown with small dark brown reticulations; dewlap skin yellowish brown; gorgetals pale green; marginals and sternals yellowish green; iris dark brown with yellowish-brown inner ring.

The coloration of populations of *Anolis ventrimaculatus* from Colombia display a dorsal surface of the body that is bright emerald green, or greenish-brown with slight darker oblique bars and yellow spots on each side of the dorsal midline; yellow spots fuse forming a series of saddle-shaped bars that cross the back and tail, more visible in the stressed phase. At their stressed phase, dorsal and lateral surface of body brown with tiny yellow spots; lateral surface of head with a yellow line under the eye and with a prominent pale yellow or green line over the lips extending back over the ear opening and along the sides of the neck; ventral surface of head yellow-green, sometimes with reticulations; ventral surface of body cream to yellow-green, with dark brown spots on the sides; ventral surface of tail orange in male adults. Some females have a dorsal surface of body with a tan longitudinal stripe and dark edges.

*Anolis ventrimaculatus* has a wide range of distribution, approximately 570 km in airline between the northern and southernmost localities. However, there is a huge distributional gap between central and southern Colombian populations (approximately 265 km airline between Bosque de San Antonio, Department Valle del Cauca and the Rio Ñambi, Department Nariño). One of the main reasons for this gap is the lack of extensive herpetological inventories in these areas, particularly in both foothills of the Andes cordilleras. More sampling effort should addressed to these areas with the aim to fill distributional gaps in several species, including *Anolis* lizards.

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**Fig. 2.** *Anolis ventrimaculatus* from Ecuador: female adult (A–B, QCAZ 4390) in dorsal and ventral view, female adult (C–D, QCAZ 4378) in dorsal and ventral view, male adult (E–F, QCAZ 4389) in dorsal and ventral view, male dewlap (G, QCAZ 4389) in lateral view. Photographs by F. Ayala-Varela.

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## First records of *Anolis ventrimaculatus* in Ecuador

**Table 2.** Scale count and measurements (mm) of specimens of *Anolis ventrimaculatus* from Ecuador and Colombia. Range (sample size) and mean. SVL = snout-vent length.

	Ecuador QCAZ	Colombia UVC, ICN, MHUA	Colombia Williams et al. 1995
Number of scales between second canthals	14–17 (10) 15.7	12–17 (18) 14.6	11–21 (20)
Number of scales bordering rostral	5–7 (10) 6.4	6–8 (18) 6.8	6–10 (20)
Number of scales between supraorbital semicircles	2–5 (10) 3.6	4–6 (18) 4.8	2–6 (20)
Number of scales between interparietal and supraorbital semicircles	7–11 (8) 6.9	6–11 (18) 8.0	5–16 (20)
Interparietal	+/-	+/very small	(+/?)
Number of loreal rows	5–8 (9) 7.9	7–9 (18) 8.2	7–11 (20)
Number of supralabials to center of eye	6–8 (10) 7.2	6–8 (18) 7.4	6–8 (20)
Number of postmentals	6–8 (9) 6.3	6–9 (18) 6.6	4–8 (20)
Number of sublabials in contact with infralabials	0–2 (9) 0.5	1–3 (18) 2.5	0–2 (20)
Lamellar number	16–18 (10) 17.2	17–22 (18) 19.4	16–22 (20)
Number of middorsals in 5% SVL	12–15 (10) 12.9	14–19 (18) 16.6	–
Number of midventrals in 5% SVL	7–11 (10) 9.2	9–14 (18) 11.9	–
Femur length	16.0–20.6 (10) 18.5	15.4–23.1 (16) 18.9	–
Maximum SVL (male/female)	62/57	75/69	80/62

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**Fernando Ayala-Varela** is the director of the herpetology collection at the Pontificia Universidad Católica del Ecuador in Quito. He received his diploma at the Pontificia Universidad Católica del Ecuador, Quito in 2004. He has been interested in herpetology since childhood and has dedicated a lot of time studying the lizards of Ecuador, specifically the taxonomy and ecology of *Anolis* species. His current research interests include reproductive biology and ecology of lizards and snakes in Ecuador.



**Julián A. Velasco** is a Ph.D. student at Instituto de Biología, Universidad Nacional Autónoma de México. His doctoral research is focused on understanding the ecological and evolutionary processes responsible for species richness and diversification of *Anolis* lizards. He addresses several evolutionary and ecological topics using a combination of conceptual and methodological approaches as niche modeling, geospatial analysis, historical biogeography, and macroecology.



**Martha Calderón** is the curator of the reptile collection at the Instituto de Ciencias Naturales, Universidad Nacional, Colombia. She obtained her doctor degree at the Universidad Nacional Autónoma de México (UNAM) in Mexico City. She works on ecomorphology, thermal ecology, reproductive biology, and molecular systematics of lizards. More information can be found here: [www.biodiversidadysistematicamolecular.blogspot.com](http://www.biodiversidadysistematicamolecular.blogspot.com)



**Alejandro Arteaga** is a wildlife photographer and undergraduate biology student from Venezuela. In 2009, he co-founded Tropical Herping, an institution striving to preserve tropical reptiles and amphibians through tourism, photography, research, and education. Alejandro is author of *The Amphibians and Reptiles of Mindo* and several scientific articles. He has described three species new to science and his photographic work has been featured in National Geographic, Anima Mundi, and the Discovery Channel.



**Yerka Sagredo Núñez** is an Associate Researcher at the Museum of Zoology, Pontifical Catholic University, Ecuador. Her bachelor’s degree was obtained in biological sciences from the Central University of Ecuador. Currently she is working as an assistant in the herpetology collection at the Museo de Zoología of the Pontificia Universidad Católica del Ecuador (QCAZ). She is interesting in ecology, behavior, and taxonomy of amphibians and reptiles. She is also involved in studies of the genus *Pristimantis*.



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