

A REVISION OF THE GREEN ANOLES OF HISPANIOLA WITH DESCRIPTION OF EIGHT NEW SPECIES (REPTILIA, SQUAMATA, DACTYLOIDAE)

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ABSTRACT

We revise the species of green anoles (i.e., the species related to *Anolis aliniger*, *A. chlorocyanus*, and *A. coelestinus*) occurring on Hispaniola. Based on our analyses of morphological and molecular genetic data we recognize 16 species of green anoles, eight of which we describe as new species (*A. apletolepis* sp. nov., *A. chlorodius* sp. nov., *A. divius* sp. nov., *A. eladioi* sp. nov., *A. gonavensis* sp. nov., *A. leucodera* sp. nov., *A. prasinorius* sp. nov. and *A. viridius* sp. nov.) and three of which are raised from subspecific to species level (*A. cyanostictus*, *A. demissus* and *A. pecuarius*) and one is resurrected from synonymy with *A. chlorocyanus* (*A. peynadoi*). Because the six syntypes of *A. chlorocyanus* (MNHN 785, 787, 2007.2066–09) are conspecific with the only available syntype of *A. coelestinus* (i.e., MCZ 3347), we have petitioned the International Commission of Zoological Nomenclature (ICZN) to use its plenary power to set aside the type status of the syntypes of *Anolis chlorocyanus* and to allow the designation of a neotype in order to stabilize the current and long established usage of the names *A. chlorocyanus* and *A. coelestinus*. For each species we provide a standardized description of external morphology, color descriptions in life, color photographs in life, description and illustration of hemipenis morphology (if available), distribution maps based on the specimens examined, comments on the conservation status, and natural history notes. Finally, we provide a dichotomous key for the identification of the 16 species of green anoles occurring on Hispaniola.

Keywords: Reptilia, *Anolis*, Dominican Republic, Haiti, Hispaniola, new species, phylogeny, taxonomy.

Título: Una revisión de los *Anolis* verdes de la Hispaniola con descripción de ocho especies nuevas (Reptilia, Squamata, Dactyloidae).

RESUMEN

Nosotros revisamos las especies de *Anolis* verdes (e.g., las especies relacionadas a *Anolis aliniger*, *A. chlorocyanus* y *A. coelestinus*.) que ocurren en la Hispaniola. Basados en nuestros análisis de datos morfológicos y moleculares, nosotros reconocemos 16 especies de *Anolis* verdes, ocho de las cuales describimos como nuevas especies (*A. apletolepis* sp. nov., *A. chlorodius* sp. nov., *A. divius* sp. nov., *A. eladioi* sp. nov., *A. gonavensis* sp. nov., *A. leucodera* sp. nov., *A. prasinorius* sp. nov. y *A. viridius* sp. nov.), tres que elevamos de subespecies a nivel de especies (*A. cyanostictus*, *A. demissus* y *A. pecuarius*) y una que es resucitada de sinonimia de *A. chlorocyanus* (*A. peynadoi*). Debido a que los seis sintipos de *A. chlorocyanus* (MNHN 785, 787, 2007.2066–09) son conespecíficos con el único sintipo disponible de *A. coelestinus* (i.e., MCZ 3347), hemos presentado una propuesta a la Comisión Internacional de Nomenclatura Zoológica (siglas en Inglés ICZN) solicitando que utilice su poder plenario para dejar a un lado el estado de tipo de los sintipos de *Anolis chlorocyanus* y permitir la designación de un neotipo con el fin de estabilizar el uso actual y habitual de los nombres de *A. chlorocyanus* y

A. coelestinus. Para cada especie nosotros proveemos una descripción estandarizada de su morfología externa, descripciones de color en vida, fotografías a color en vida, descripción e ilustración de la morfología de los hemipenes (cuando están disponibles), mapa de distribución basado en los especímenes examinados, comentarios sobre el estado de conservación y notas de su historia natural. Finalmente, proveemos una clave dicotómica para la identificación de las 16 especies de *Anolis* verdes que ocurren en la Hispaniola.

Palabras clave: Reptilia, *Anolis*; República Dominicana, Haití, Hispaniola, especies nuevas, filogenia, taxonomía.

INTRODUCTION

Hispaniola supports a diverse herpetofauna that seems reasonably well studied (Schwartz & Henderson, 1991). With 44 species, the anoles form one of the most species-rich groups of amphibians and reptiles (244 species) on this island (Hedges, 2015).

In 1837, Duméril and Bibron described *Anolis chlorocyanus* (as *Anolis chloro-cyanus*) based on six syntypes (now MNHN 785, 787, 2007.2066–09; Figs. 1-3) from “Martinique and St.-Domingue”. As pointed out by Mertens (1939:63), this species does not occur on the island of Martinique, and “St.-Domingue” at that time did not refer to the town of Santo Domingo but to the whole island Hispaniola. In 1862, Cope introduced his new species *Anolis (Ctenocercus) coelestinus* from “Western Hayti. ... near Jérémie”. He used the plural form “specimens” although he reported the measurements and meristic data only for a single male specimen – as judged by the mentioning of a well-developed dewlap (“goitre large”) in the original description – and provided “No. 1500 Mus., Compar. Zool.” as the museum number for his material. In 1914, Barbour mentions that he had examined “the types of *A. coelestinus* (M. C. Z., No. 2,347)”, supporting the evidence that the original type material consisted of more than a single specimen.

We obtained on loan a female specimen (MCZ 3347, Figs. 4 and 5) labeled “syntype” in the MCZ catalogue. According to the notes in the MCZ entry book (MCZ website), MCZ 3347 was collected by “Dr. Weinland” in “Hayti, near Jérémie” (original number “695”). This referred to David Friedrich Weinland, who spent six months in Jérémie, Haiti, in 1857–1858, and collected specimens of amphibians and reptiles later donated to the MCZ (Hedges & Conn, 2012). Ramos and Powell (2001b:729.3) reported upon “a cryptic note in EEW’s [E.E. Williams’] hand noting that it [MCZ-R 3347] cannot be a syntype since it was received after Cope’s description. However, they point out that because no collection dates are entered, a syntype could have been received after its description. Boulenger (1885) listed *A. coelestinus* as a synonym of *A. chlorocyanus*, a view that was later shared by Barbour (1914). In his checklist of Caribbean anoles, Barbour (1930b:119) resurrected *A. coelestinus* from the synonymy of *A. chlorocyanus*, stating that the latter has a “greater number of loreal rows” and “smaller scales on the back, very fine scales on the dewlap, a different habit and coloration.” Since that time this two-species concept and the respective assignments of names remained unchanged (Mertens 1939, Williams 1965, Ramos & Powell 2001a, b). Schmidt (1919) described *Anolis latirostris* from Navassa Island based on a male specimen (now AMNH 12598; not examined by authors). Thomas (1966) concluded that AMNH 12598 was conspecific with *A. coelestinus*, and therefore actually had erroneous locality data. He suggested that it most likely was collected in the Les Cayes region, Haiti. In 1939, Mertens described three new taxa of green anoles from the Dominican Republic, all as subspecies of *A. chlorocyanus*: *Anolis chlorocyanus cyanostictus* (holotype SMF 26290) from “Zwischen Fortaleza und der Mündung des Rio Jaina”; *Anolis chlorocyanus aliniger* (holotype SMF 25825) from “Unterhalb von Paso Bajito, etwa 900 m H.”; and *Anolis chlorocyanus peynadoi* (holotype SMF 26201) from “Südlich von Fondo Negro, unterer

Río Yaque del Sur”. Williams (1965) described *A. singularis* (holotype MCZ 72043 from “Pourcine, Massif de la Hotte, Haiti”) and treated *A. aliniger* as a full species. In his view, *A. singularis* and *A. aliniger* form a natural group as do *A. chlorocyanus* and *A. coelestinus*. Williams (1965) did not address the other two nominal taxa described by Mertens (1939). Schwartz (1969) described the populations of *A. coelestinus*-like anoles from two islands off the Península de Tiburón, Haiti, as subspecies of *A. coelestinus*: *Anolis coelestinus demissus* (holotype MCZ 92049 from “vicinity of Pointe Sable, Ile Grande Cayemite, Haiti”); and *Anolis coelestinus pecuarius* (holotype MCZ 81141 from “Western end, Ile-à-Vache, Haiti”). Powell (1993) suggested that these island forms might deserve to be elevated to species status. However, despite of an enormous activity in herpetological research in the Caribbean in general (see compilations e.g., in Schwartz & Henderson, 1991; Henderson & Powell, 2009) and with Caribbean anoles specifically (e.g., Losos, 2009, and references therein), the taxonomy of the green anoles of Hispaniola has not been addressed since the late 1960s.

Currently, four species of predominantly green (in life) anoles are recognized (Williams, 1965): *Anolis aliniger* Mertens, 1939, *A. chlorocyanus* Duméril & Bibron, 1837, *A. coelestinus* Cope, 1863, and *A. singularis* Williams, 1965. Williams (1965) suggested that the Hispaniolan assemblage of anoles that share an overall green coloration, short legs (ratio shank length/SVL <0.25), long heads (ratio head length/SVL >0.25), and a more or less round (in cross section) tail comprise a “natural species-group and not an assemblage of forms that convergently adapted to the tree-crown niche.” Generally, we agree with this assumption but also observed much more diversity than is reflected by the current taxonomy of this group of anoles. We see three tightly related species clusters (i.e., species related to *A. chlorocyanus*; species related to *A. coelestinus*; and species related to *A. aliniger*), and will present the results of our analysis accordingly.

OBJECTIVES

- The objectives of the present study are the revision of the green anoles (genus *Anolis*) that are known to occur on Hispaniola, including both morphological and molecular genetics as lines of evidence, in order to define the morphological and geographical species boundaries in this group of lizards.

MATERIALS AND METHODS

For this study, we have examined a total of 787 specimens of green anoles from Hispaniola. Abbreviations for museum collections follow Sabaj Pérez (2012) except for MNHNSD (Museo Nacional de Historia Natural “Prof. Eugenio de Jesús Marcano”, Santo Domingo, Dominican Republic). Coordinates and elevation were recorded using Garmin GPS receivers with built-in altimeters. All coordinates are in decimal degrees, WGS 1984 datum, and rounded to the fifth decimal place. Prior to preservation of collected specimens in the field, we took color photographs of each individual’s extended dewlap. For this purpose, Gunther Köhler (GK) preferably utilized the standard forceps of genuine Swiss Army Knives since their broad, flat apex prevents even thin-skinned dewlaps from damage and functions as an approximate scale (width = 3 mm in the models of both suppliers). Immediately after euthanasia, relative hind limb length was determined by recording the point reached by the tip of the fourth toe when the extended hind limb was addressed along the straightened specimen. Tissue samples were cut from the tip of the tail of selected individuals before they came in contact with formalin, stored in 98% non-denatured ethanol. Whenever possible, we everted the hemipenes of male specimens by injecting 70% ethanol into the hemipenial pockets after manually pre-everting the hemipenes. Specimens were then preserved by injecting a solution of 5 mL absolute (i.e., 36%) formalin in 1 L of 96% ethanol into the body cavity and thighs, preferably also sprinkling everted hemipenes

and extended dewlaps with this solution, and stored in 70% ethanol. The collected specimens have been deposited in the collection of the Senckenberg Forschungsinstitut Frankfurt (SMF), and the remaining specimens, here indicated with GK field numbers, have been deposited in the Museo Nacional de Historia Natural (MNHNSD), Santo Domingo, Dominican Republic. The capitalized colors and color codes (the latter in parentheses) are those of Köhler (2012). Terminology of markings used in color descriptions follow Köhler (2012). Nomenclature of scale characters follows that of Köhler (2014). Head length was measured from the tip of the snout to the anterior margin of the ear opening. Snout length was measured from the tip of the snout to the anterior border of the orbit. Head width was determined with the broad tips of the calipers aligned with the levels of posterior margin of eye and supralabial scales, respectively, with the calipers held in a vertical position relative to the head. Dorsal and ventral scales were counted at midbody along the midline. Tail height and width were measured at the point reached by the heel of the extended hind leg. Subdigital lamellae were counted on Phalanges II to IV of Toe IV of the hind limbs, and separately on distal phalanx. We considered the scale directly anterior to the circumnasal to be a prenasal. Abbreviations used are AGD (axilla–groin distance), dorsAG (number of medial dorsal scales between levels of axilla and groin), dorsHL (number of medial dorsal scales in one head length), HDT (horizontal diameter of tail), HL (head length), HW (head width), IFL (infralabials), IP (interparietal plate), SAM (scales around midbody), ShL (shank length), SL (snout length), SO (subocular scales), SPL (supralabial scales), SS (supraorbital semicircles), SVL (snout–vent length), TL (tail length), VDT (vertical diameter of tail), ventrAG (number of medial ventral scales between levels of axilla and groin), and ventrHL (number of medial ventral scales in one head length). In reporting the frequencies of character states, we used the following terminology (Köhler submitted): if a character state was present in more than 65% of the examined specimens, we coded it as “usually”; <65% but >20% “commonly”; <20% but >5% “occasionally”; and <5% “exceptionally”. The use of size categories also follows Köhler (2014): (1) small: <50 mm SVL; (2) moderate-sized: 50–60 mm SVL; (3) moderately large: 60–80 mm SVL; (4) large: 80–110 mm SVL; (5) giant: >110 mm SVL. Synonymies in the species accounts are restricted to the major checklists of the Caribbean herpetofauna, regional treatments, and relevant taxonomic works.

It is known that Hispaniola is a composite of two separate paleo-islands that collided about 10 million years ago (Hedges, 1996). Herein we refer to the southern and northern regions as the South Island and North Island, respectively, following Mertens (1939) and Schwartz (1978). Today they are connected by dry land that is below sea level, the Valle de Neiba (Dominican Republic) and Cul de Sac (Haiti).

As lines of evidence for species delimitation, we apply a phenotypic criterion (external morphology: coloration, morphometrics, and pholidosis) and a criterion for reproductive isolation (genetic distinctness of the cytochrome B and ND2 genes). Sequences from 77 ingroup and two outgroup taxa were analyzed (a total of 2217 aligned sites). Alignments (MUSCLE) and best-fit model selection were performed in MEGA 6.06 (Tamura *et al.*, 2013). A maximum likelihood (ML) analysis was performed using MEGA 6.06), unpartitioned, using the evolutionary model GTR + I + Γ . Gaps were treated as missing data. All parameters for the ML analyses were estimated by the program during the run. Branch support in the trees was provided by standard bootstrap analysis (2,000 replicates). A Bayesian phylogenetic analysis using MrBayes 3.2.2 (Ronquist *et al.*, 2012) also was performed, also using the GTR + I + Γ model. The Bayesian analysis was set to two parallel runs for five million generations, sampled every 100 generations, each run employed three heated and one cold chain, with a temperature parameter of 0.10. The first 10% of samples were discarded as burn-in. Convergence was assessed by the standard deviation of split frequencies (< 0.01 in all cases).

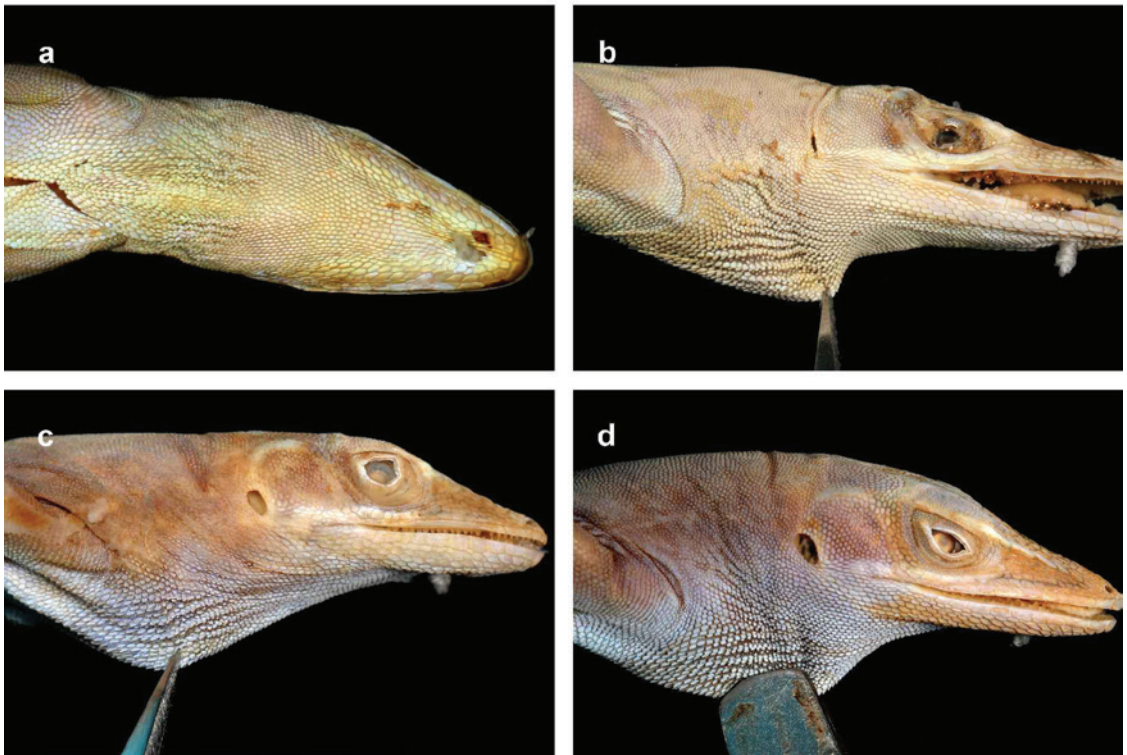


Figure 1. Syntypes of *Anolis chlorocyanus*. Gular region: (a) MNHN 785; (b) MNHN 2007.2406; (c) MNHN 2007.2407; (d) MNHN 2007.2408. Photos by G.K.

In the past there have been attempts to partition anoles into multiple genera, but even the latest attempt (Nicholson *et al.*, 2012) has been met with resistance (Castañeda & de Queiroz, 2013; Poe, 2013; but see also response by Nicholson *et al.*, 2014). Because this study does not bear on generic partitioning, and until the debate has been settled, we choose to be conservative and use the name *Anolis* in this article. Also, we use the informal taxonomic categories of species series and species group, popularized by Williams (1976), updated by Burnell and Hedges (1990). Thus, we refer to the clade under consideration as the *chlorocyanus* series.

RESULTS

GK has examined the six syntypes of *Anolis chlorocyanus* (MNHN 785, 787, 2007.2066–09) and was surprised to learn that these do not represent the taxonomic species this name is traditionally being used for but rather are conspecific with the only available syntype of *A. coelestinus* (i.e., MCZ 3347). Since Barbour (1930), the name *A. chlorocyanus* has been consistently applied to the green anole of Hispaniola characterized by having (1) a dewlap with scattered large scales not arranged in double rows and with a suffusion of black pigment on the posterior portion; (2) usually no white subocular stripe; (3) 12–24 loreal scales arranged in 3–4 rows; (4) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (5) (7) ratio tail length / SVL >1.7, usually >2.0. For the same period of time the name *A. coelestinus* has been consistently applied to another taxonomic species, characterized by having (1) a dewlap with double rows of small scales and without a suffusion of black pigment on the posterior portion; (2) usually a white subocular stripe; (3) 18–45, usually >24 loreal scales arranged in 4–6 rows; (4) 38–45 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (5) (7) ratio tail

length / SVL >1.7, usually >2.0. The syntypes of *A. chlorocyanus* (1) have dewlaps of double rows of small scales with no indication of a suffusion of black pigment on the posterior portion (Fig. 1); (2) a more or less distinct white subocular stripe; (3) 34–45 loreal scales arranged in 5–6 rows. Thus, the syntypes of *A. chlorocyanus* have the diagnostic traits of the taxonomic species traditionally referred to as *A. coelestinus*. We have petitioned the International Commission of Zoological Nomenclature (ICZN) to use its plenary power to set aside the type status of the syntypes of *Anolis chlorocyanus* in order to stabilize the current and long established usage of the names *A. chlorocyanus* and *A. coelestinus* (Köhler & Hedges, 2015); it is proposed that SMF 97845 should be designated as the neotype of *A. chlorocyanus* Duméril & Bibron 1837.

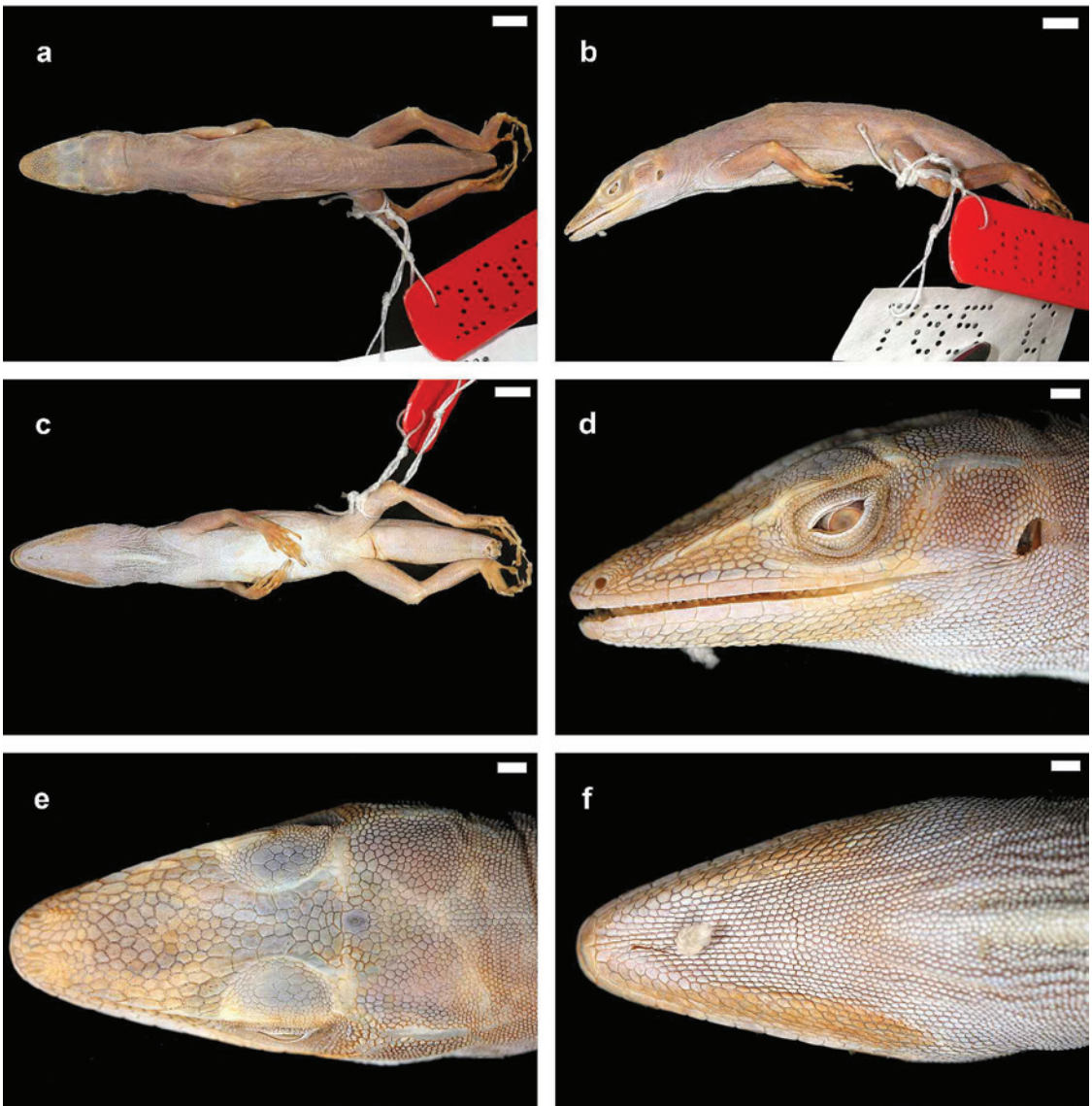


Figure 2. Syntype of *Anolis chlorocyanus* (MNHN 2007.2408). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

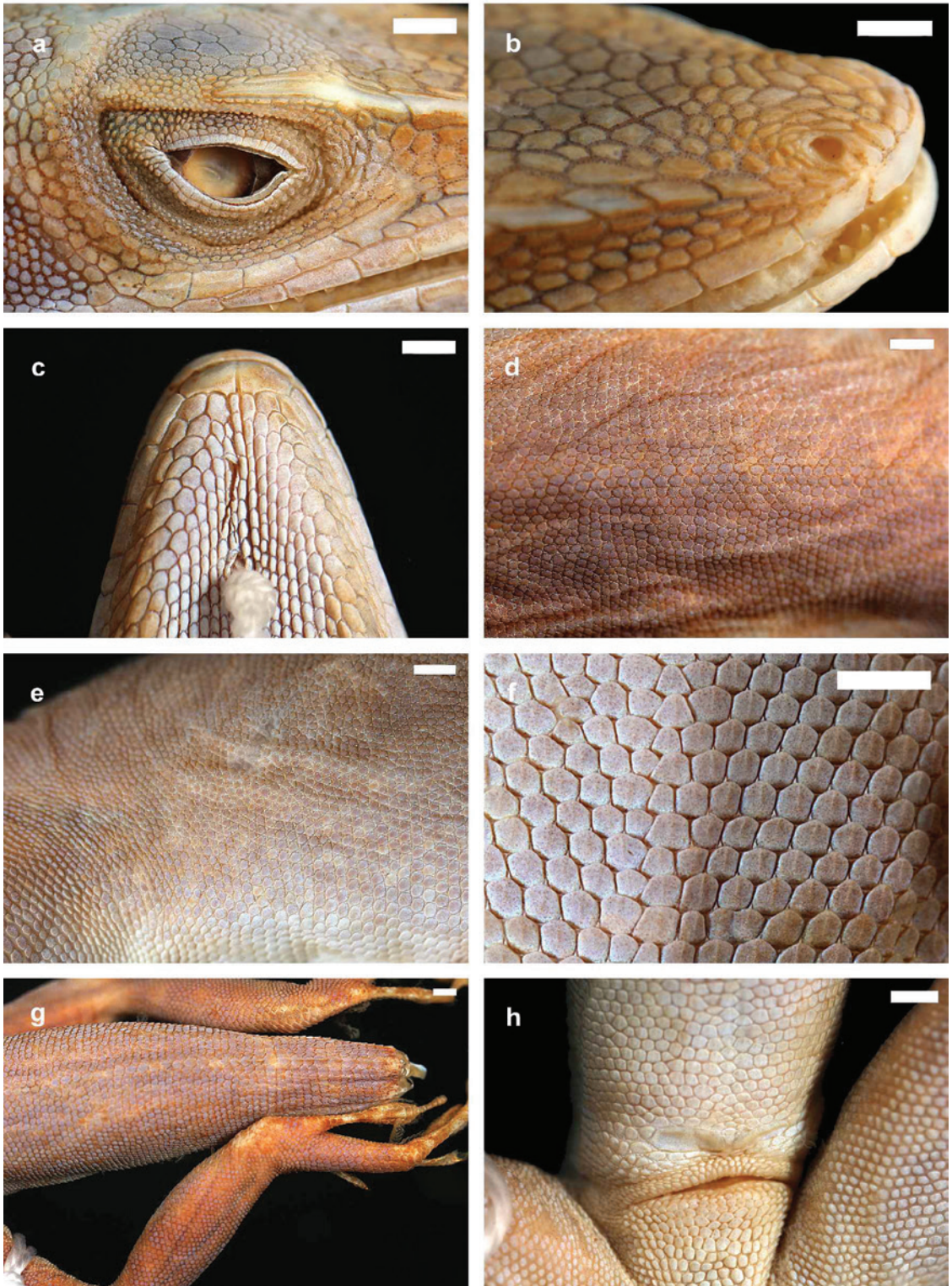


Figure 3. Syntype of *Anolis chlorocyanus* (MNHN 2007.2408). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) base of tail; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

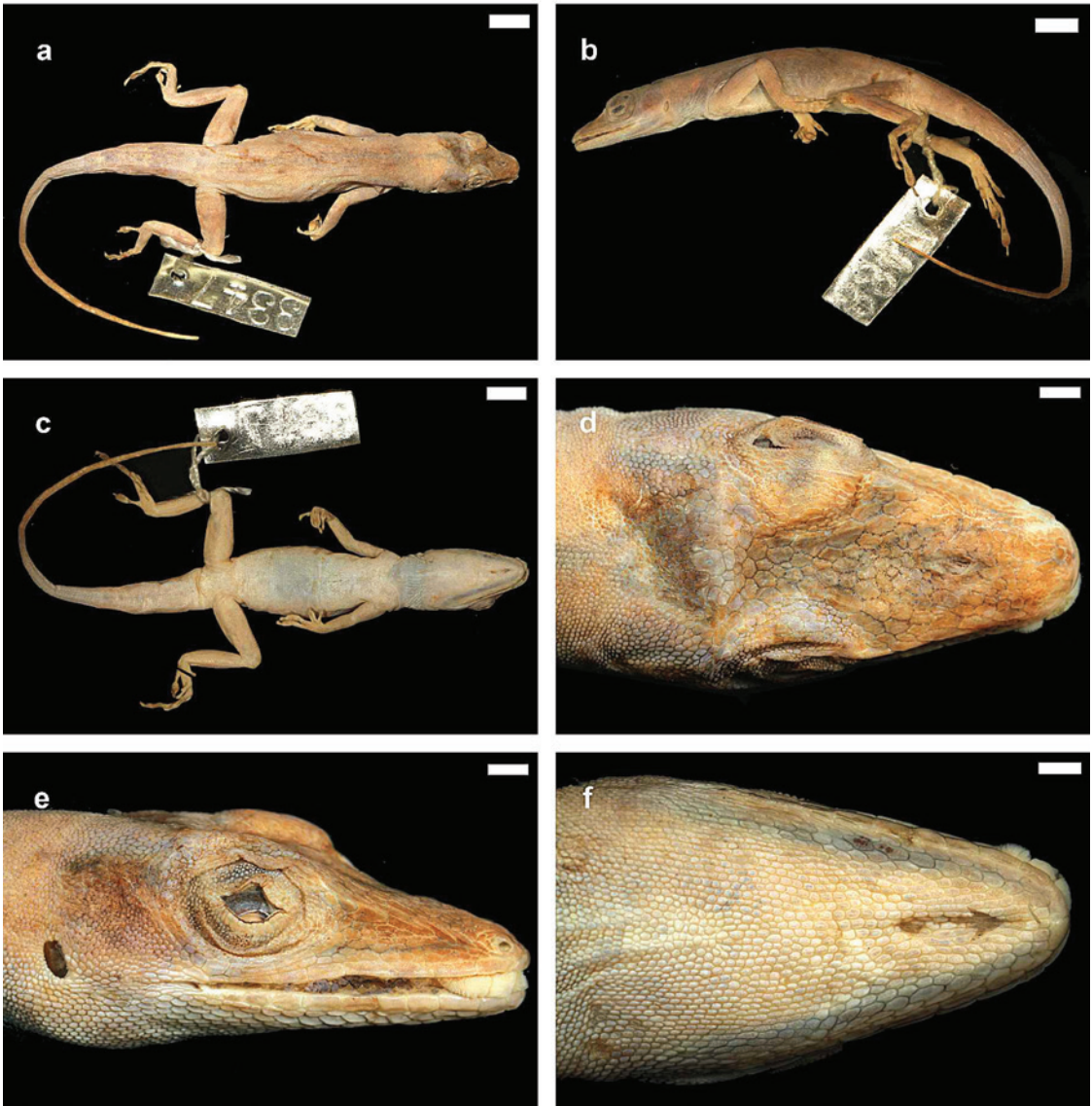


Figure 4. Lectotype of *Anolis coelestinus* (MCZ 3347). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

The specimen SMF 97845 is an adult male, collected on 21 October 2013 by Gunther Köhler (field tag number GK-4718) at El Limón, Península de Samaná (19.28929, -69.43118), 30 m, Province Samaná, Dominican Republic, that represents the taxonomic species traditionally referred to as *A. chorocyanus*. To avoid any confusion that would be caused by switching the meaning of the names *A. chlorocyanus* and *A. coelestinus* we here continue to use these species names with their established meaning and hope that the ICZN will rule in favor of our proposal. In the same proposal we have designated the only available syntype of *A. coelestinus*, MCZ 3347, as lectotype of *A. coelestinus*. In the present contribution we continue to use the names *A. coelestinus* and *A. coelestinus* in their accustomed usage.

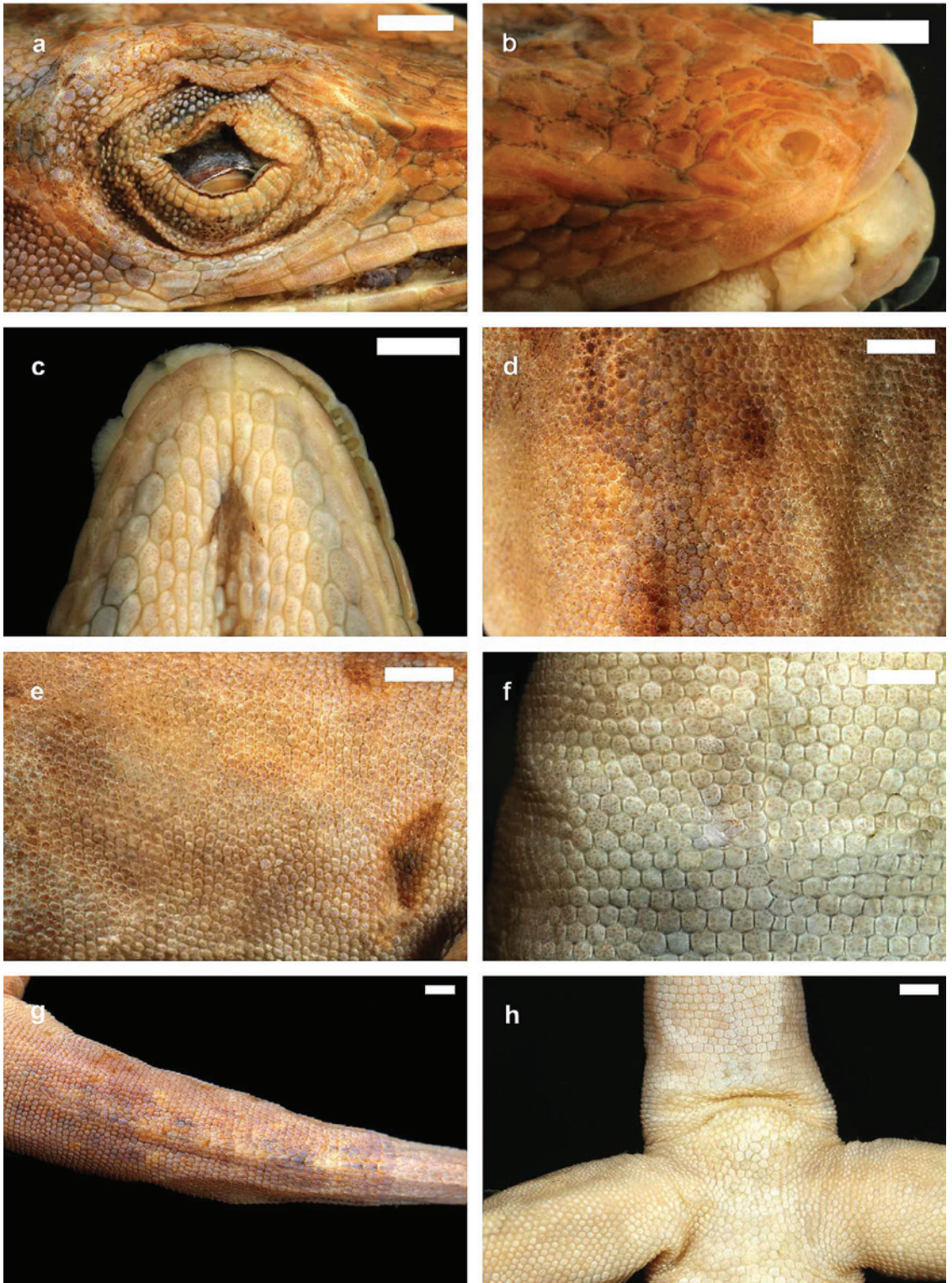


Figure 5. Lectotype of *Anolis coelestinus* (MCZ 3347). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) base of tail; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

TAXONOMY OF THE ANOLES IN THE *ANOLIS COELESTINUS* SPECIES GROUP

The anoles in the *Anolis coelestinus* species group are readily differentiated from all other Hispaniolan congeners by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) a white subocular stripe that continues as a white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth or keeled; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales.

The analysis of our molecular data reveal four distinct genetic clusters among the anoles in the *coelestinus* species group (Fig. 6). We take this high level of genetic differentiation between these four genetic clusters as evidence for lack of gene flow and in conclusion recognize these four clusters as species level units. Also, based on the evidence presented by Schwartz (1969), we recognize the population on Île Grande Cayemite, Haiti, as a distinct species. Therefore, we recognize five species in the *coelestinus* species group as follows: Species A (western portion of the Tiburón Peninsula along the northern coast to the region of Trou Caiman, Département d'Ouest, Haiti); Species B (Île-à-Vache, Haiti); Species C (Île Grande Cayemite, Haiti); Species D (south coast of the eastern portion of the Tiburón Peninsula, Haiti, to the western portion of the Barahona Peninsula, Dominican Republic); and Species E (eastern portion of the Barahona Peninsula, Dominican Republic). In external morphology, these five species are not easily differentiated (Table I). However, subtle differences between most of these clusters are evident supporting the recognition of each of these as a distinct species.

Since the lectotype (MCZ 3347) of *A. coelestinus* Cope 1862 is from “Western Hayti. ... near Jérémie”, this is the valid name for our Species A. This is supported by the condition of the ventral scales in MCZ 3347 which are keeled. The clade with specimens from Île-à-Vache, Haiti (our Species B) is referred to as *A. pecuarius* because the type locality of this taxon is this island. Our Species C (Île Grande Cayemite, Haiti) is referred to as *A. demissus* because the type locality of this taxon is this island. No names are available for our Species D and E, and therefore we describe each of them as a new species below.

TAXONOMÍA DE LOS *ANOLIS* EN EL GRUPO DE ESPECIES DE *ANOLIS COELESTINUS*

Los *Anolis* en el grupo de especies de *Anolis coelestinus* se diferencian claramente de todos los otros congéneres de la Hispaniola por tener una combinación de (1) coloración general predominantemente verde en vida (capaces de cambiar rápidamente de color a marrón); (2) raya subocular blanca que continua como una raya blanca a los lados del cuello; (3) patas posteriores relativamente cortas (cuarto dedo de la pata extendida lateralmente a lo largo del cuerpo alcanzando a la abertura del oído o solo ligeramente mas allá de la abertura del oído); (4) las escamas ventrales a mitad del cuerpo lisas o aquilladas; (5) 39–47 lamelas subdigitales en las Falanges II–IV del IV dedo de las patas posteriores; (6) saco gular en vida de los machos verde amarillento o marrón (después de metacrosis) con hileras dobles oblicuas o longitudinales de escamas gorgetales.

El análisis de nuestra data molecular revela cuatro agrupaciones genéticas entre los *Anolis* del grupo de especies *coelestinus* (Fig. 6). Consideramos este alto nivel de diferenciación genética entre estos cuatro grupos genéticos como evidencia de falta de flujo genético y en conclusión reconocemos estos cuatro agrupamientos como unidades a nivel de especies. También, basados

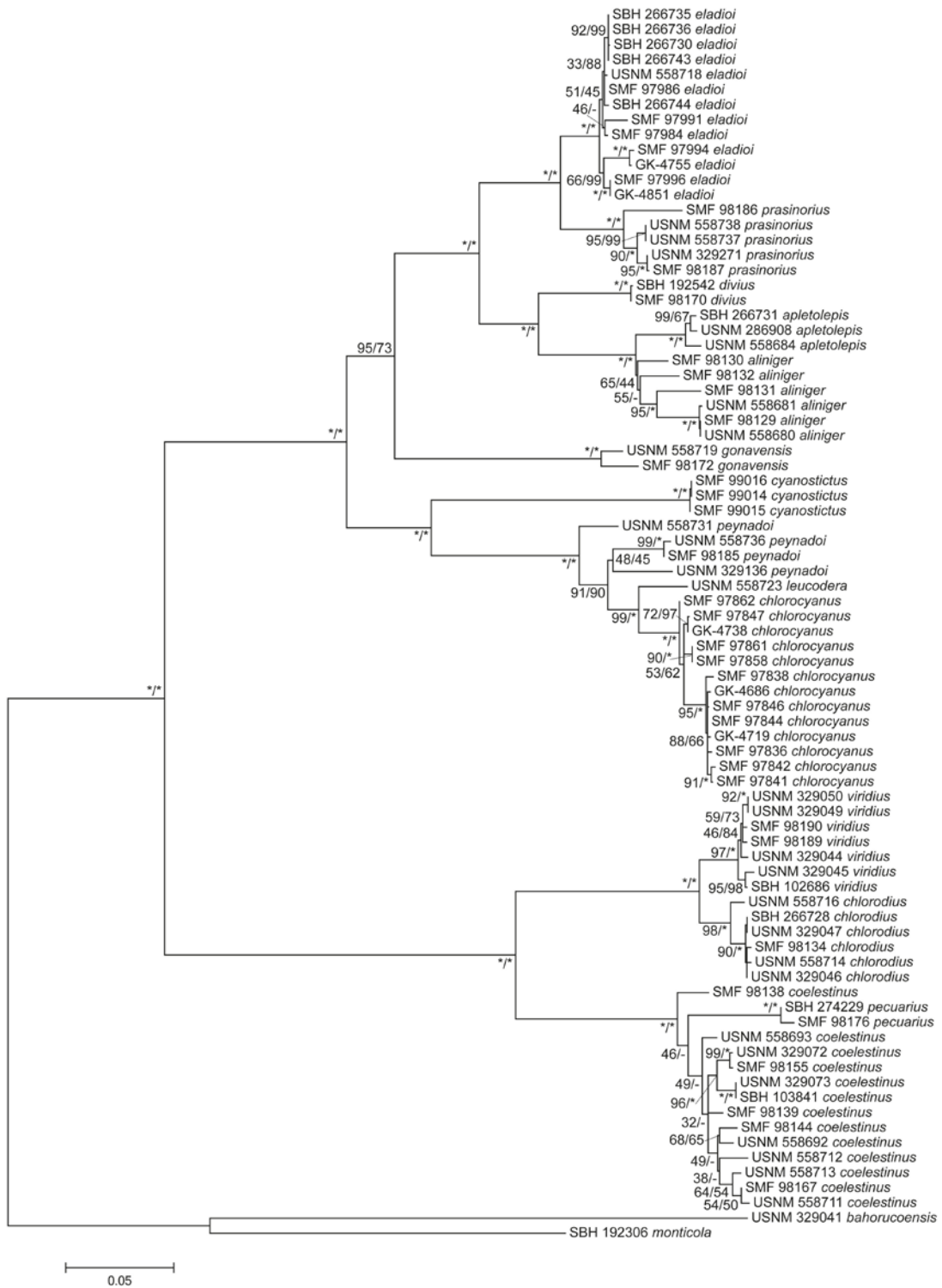


Figure 6. Phylogenetic tree of specimens of the Hispaniolan green anoles from a maximum-likelihood analysis of DNA sequences of two mitochondrial genes: cytochrome b and ND2. A scale bar is indicated. The numbers at nodes are bootstrap values (left) and Bayesian posterior probabilities (right). Asterisks indicate 100% support. The tree is rooted with the species *Anolis bahorucoensis* (USNM 329041: KJ566802, KJ566880) and *A. monticola* (SBH 192306: KJ566823, KJ566889).

en la evidencia presentada por Schwartz (1969), reconocemos la población de Île Grande Cayemite, Haiti, como una especie distinta. Por consiguiente, reconocemos cinco especies en el grupo de especies *coelestinus* de la manera siguiente: Especie A (porción occidental de la Península de Tiburón a lo largo de la costa norte de la región de Trou Caiman, Département d'Ouest, Haiti); Especie B (Île-à-Vache, Haiti); Especie C (Île Grande Cayemite, Haiti); Especie D (costa sur de la porción oriental de la Península de Tiburón, Haití, hasta la porción occidental de la Península de Barahona, República Dominicana); and Especie E (porción oriental de la Península de Barahona, República Dominicana. En base a su morfología externa, estas cinco especies no se diferencian fácilmente (Tabla I). Sin embargo, ligeras diferencias entre la mayoría de estos agrupamientos genéticos son evidentes, sirviendo de apoyo al reconocimiento de cada uno de estos como una especie distinta.

Desde que el lectotipo (MCZ 3347) de *A. coelestinus* Cope, 1862 es del “Occidente de Hayti. ... cerca de Jérémie”, este es el nombre válido para nuestra Especie A. Esto es apoyado por la condición de las escamas ventrales en MCZ 3347 las cuales son aquilladas. El clado con especímenes de Île-à-Vache, Haiti (nuestra Especie B) es referido como *A. pecuarius* debido a que la localidad tipo de esta especie es esta isla. Nuestra Especie C (Île Grande Cayemite, Haiti) es referida como *A. demissus* debido a que la localidad tipo de esta especie es esta isla. No hay nombres disponibles para nuestras Especies D y E, y por tanto describimos cada una de ellas más abajo como una nueva especie.

Table 1. Selected measurements proportions and scale characters of the species of green anoles from Hispaniola. Range is followed by mean value and standard deviation in parentheses. For abbreviations see text. Values marked with an asterisk are those from Schwartz (1969).

Species	Sample size	max. SVL males (mm)	max. SVL fe- males (mm)	LSR	LST	SPL	IFL
<i>alinger</i>	♂ 16 ♀ 24	58.0	52.0	3–5 (3.9±0.56)	11–29 (19.3±4.18)	5–8 (6.6±0.75)	5–9 (6.6±1.07)
<i>apletolepis</i>	♂ 2 ♀ 2	58.5	49.5	3–4 (3.8±0.50)	15–25 (19.0±4.90)	5–7 (6.0±0.82)	5–7 (6.3±0.96)
<i>chlorocyanus</i>	♂ 10 ♀ 12	75.0	53.0	3–4 (3.3±0.44)	12–24 (16.7±3.06)	6–8 (6.6±0.60)	5–8 (6.6±0.68)
<i>chlorodius</i>	♂ 10 ♀ 37	82.0	56.0	4–7 (5.4±0.68)	31–60 (39.8±6.18)	7–9 (7.9±0.71)	6–9 (7.4±0.88)
<i>coelestinus</i>	♂ 14 ♀ 20	77.0	56.0	4–6 (4.9±0.60)	18–36 (28.6±4.52)	6–9 (7.1±0.67)	5–9 (7.1±0.96)
<i>cyanostictus</i>	♂ 7 ♀ 10	70.0	52.0	4–5 (4.7±0.48)	18–30 (24.7±3.56)	6–8 (7.2±0.75)	5–8 (6.7±0.90)
<i>demissus</i>	♂ 3 ♀ 0	76.0	53.0*	5–6 (5.3±0.58)	30–44 (36.3±7.09)	7–8 (7.7±0.58)	7 (7.0±0.00)
<i>divius</i>	♂ 3 ♀ 3	68.0	55.0	3–4 (3.3±0.42)	11–18 (13.5±2.83)	5–8 (6.2±1.17)	6–8 (7.3±0.82)
<i>eladioi</i>	♂ 14 ♀ 16	63.0	56.0	3–5 (3.9±0.54)	15–30 (21.2±4.36)	6–7 (6.9±0.31)	6–8 (6.9±0.43)
<i>gonavensis</i>	♂ 1 ♀ 1	42.5	38.5	4	21–24	6–7	6
<i>leucodera</i>	♂ 6 ♀ 3	77.0	57.0	3 (3.0±0.00)	12–17 (14.9±2.35)	6–7 (6.6±0.53)	6–8 (6.5±0.61)
<i>pecuarius</i>	♂ 10 ♀ 0	72.5 (78.0*)	55.0*	5–6 (5.6±0.53)	33–46 (41.4±4.47)	7–8 (7.6±0.52)	7–8 (7.6±0.52)
<i>peynadoi</i>	♂ 14 ♀ 11	75.5	55.0	3–4 (3.5±0.50)	15–24 (19.0±2.64)	6–8 (7.0±0.56)	6–8 (7.0±0.73)
<i>prasinorius</i>	♂ 13 ♀ 7	45.0	43.0	3–4 (3.8±0.43)	14–24 (18.4±2.51)	6–8 (6.9±0.73)	6–8 (7.1±0.81)
<i>singularis</i>	♂ 1 ♀ 0	40.0	–	4	17	6–7	8
<i>viridius</i>	♂ 13 ♀ 21	83.0	61.0	4–6 (5.3±0.52)	25–48 (34.9±5.98)	6–9 (7.7±0.75)	6–9 (7.3±0.68)

Table I (continued).

Species	IO	IP/IO	1Canths	2Canths	PM	PR	IN
<i>aliniger</i>	0-2 (1.0±0.43)	1-4 (2.2±0.63)	8-11 (9.6±0.98)	6-10 (8.1±1.06)	5-8 (5.9±0.57)	4-7 (5.1±0.54)	5-7 (6.0±0.56)
<i>apletolepis</i>	0-1 (0.8±0.50)	1-3 (2.3±0.96)	8-10 (9.0±0.82)	6-8 (7.0±0.82)	5-6 (5.8±0.50)	4-5 (4.8±0.50)	6-6 (6.0±0.00)
<i>chlorocyanus</i>	1-2 (1.2±0.41)	2-4 (2.7±0.50)	6-10 (8.4±1.27)	5-10 (7.2±1.14)	4-6 (5.4±0.88)	3-7 (4.6±0.98)	4-7 (5.2±1.03)
<i>chlorodius</i>	1-3 (2.0±0.43)	3-6 (3.7±0.79)	10-17 (12.5±1.62)	10-15 (12.5±1.11)	5-8 (6.0±0.43)	0-9 (6.4±2.15)	6-9 (7.6±0.74)
<i>coelestinus</i>	1-2 (1.8±0.40)	2-4 (2.8±0.40)	9-15 (11.7±1.45)	9-15 (11.6±1.31)	5-8 (6.2±0.72)	5-7 (5.5±0.59)	6-9 (7.5±0.65)
<i>cyanostictus</i>	1-2 (1.3±0.47)	3-4 (3.1±0.54)	8-11 (9.1±1.10)	6-10 (7.8±1.32)	4-8 (5.6±1.33)	3-5 (4.2±1.03)	3-7 (4.8±1.33)
<i>demissus</i>	1-2 (1.7±0.58)	2-4 (2.8±0.76)	13-15 (13.7±1.15)	9-13 (10.7±2.08)	6-8 (6.7±1.15)	6-8 (7.3±1.15)	8 (8.0±0.00)
<i>divius</i>	0-1 (0.8±0.41)	1-3 (2.3±0.61)	6-9 (7.5±1.05)	6-8 (6.8±0.75)	5-6 (5.8±0.41)	4-7 (5.5±1.05)	5-6 (5.8±0.41)
<i>eladioi</i>	1-2 (1.1±0.29)	2-4 (2.4±0.61)	6-11 (8.7±1.28)	6-9 (7.0±0.97)	4-7 (5.5±0.86)	5-7 (5.4±0.58)	6-7 (6.1±0.29)
<i>gonavensis</i>	1	2-3	10-11	9-10	6-7	4	116-136
<i>leucodera</i>	0-1 (0.9±0.33)	2-4 (2.6±0.70)	7-10 (8.2±1.20)	6-9 (7.6±1.01)	6 (6.0±0.00)	5-6 (5.1±0.35)	6 (6.0±0.00)
<i>pectarius</i>	1-2 (1.5±0.53)	3 (2.8±0.27)	11-13 (11.6±0.74)	10-13 (11.6±1.19)	6-8 (6.8±0.83)	5-7 (5.7±0.71)	7-9 (7.6±0.73)
<i>peynadoi</i>	0-1 (0.9±0.31)	3-4 (3.2±0.44)	7-11 (8.6±0.99)	6-8 (7.4±0.68)	4-6 (5.4±0.88)	5-6 (5.2±0.41)	6-7 (6.4±0.49)
<i>prasiniarius</i>	0-2 (1.0±0.33)	1-3 (2.1±0.74)	6-11 (8.3±1.19)	6-9 (7.6±0.69)	5-6 (5.6±0.50)	4-6 (5.2±0.63)	4-7 (5.9±0.81)
<i>singularis</i>	1	2	9	10	7	5	6
<i>viridius</i>	1-3 (2.3±0.64)	3-5 (3.6±0.76)	9-17 (13.0±1.58)	9-16 (11.4±1.73)	6 (6.0±0.00)	5-8 (6.3±0.84)	6-9 (7.6±0.71)

Table 1 (continued).

Species	ToeLam prox	ToeLam dist	SAM	dorsHL	dorsAG	ventrHL	ventrAG
<i>alinger</i>	30–37 (34.0±1.95)	7–9 (7.7±0.59)	108–142 (126.6±8.26)	34–70 (45.8±7.24)	55–86 (70.6±8.32)	30–48 (38.2±5.49)	45–68 (55.8±5.56)
<i>apletolepis</i>	33–35 (34.0±0.82)	6–9 (7.5±1.29)	116–128 (121.5±5.00)	38–50 (42.8±5.25)	53–62 (58.80±4.03)	32–40 (36.3±3.86)	50–56 (53.0±3.46)
<i>chlorocyanus</i>	38–46 (41.3±2.38)	6–8 (7.0±0.56)	104–134 (116.4±7.04)	34–58 (43.6±5.05)	58–78 (65.1±5.94)	28–48 (37.6±5.60)	48–62 (55.3±3.55)
<i>chlorodius</i>	39–49 (43.5±2.55)	7–9 (7.7±0.66)	112–150 (128.6±8.76)	44–64 (49.8±4.12)	63–100 (80.1±9.91)	36–56 (43.9±4.07)	56–68 (61.8±3.15)
<i>coelestinus</i>	38–45 (41.0±2.19)	7–10 (8.0±0.72)	114–140 (125.5±8.44)	44–62 (53.2±4.28)	71–103 (85.5±6.36)	34–54 (41.0±5.65)	52–78 (64.2±6.44)
<i>cyanosfictus</i>	38–49 (42.7±3.64)	7–8 (7.6±0.50)	106–132 (120.2±8.02)	42–64 (48.5±6.76)	57–94 (73.6±10.70)	34–50 (45.1±5.68)	52–65 (60±4.20)
<i>demissus</i>	41–43 (42.0±1.00)	8 (8.0±0.00)	128–140 (134.7±6.11)	51–54 (52.3±1.53)	77–79 (78.3±1.15)	40–46 (43.3±3.06)	64–72 (68.0±4.00)
<i>divius</i>	31–37 (34.4±2.33)	7–8 (7.5±0.55)	111–138 (123.2±11.14)	34–45 (39.0±4.56)	48–69 (60.0±6.93)	36–42 (39.7±2.25)	53–61 (56.2±2.93)
<i>eladioi</i>	32–37 (34.7±1.71)	7–9 (7.7±0.65)	108–140 (123.1±9.06)	34–48 (43.3±3.52)	58–78 (66.9±6.63)	32–48 (38.8±4.44)	49–59 (54.6±3.53)
<i>gonavensis</i>	30–32	6–7	61	50–60	–	37–54	80
<i>leucodera</i>	40–46 (41.8±1.77)	6–7 (6.8±0.44)	101–116 (109.7±4.95)	30–42 (35.6±4.07)	54–63 (58.3±3.24)	36–44 (39.1±2.62)	57–60 (58.3±1.32)
<i>pecuarius</i>	38–44 (41.9±1.69)	8–9 (8.2±0.44)	122–156 (138.2±13.47)	44–64 (52.9±7.49)	83–88 (85.1±1.95)	34–46 (41.5±3.93)	62–71 (66.5±3.25)
<i>peynadoi</i>	39–44 (41.9±1.42)	6–8 (6.8±0.55)	107–130 (118.3±6.41)	36–48 (41.1±2.97)	57–72 (65.8±4.01)	35–45 (40.3±3.08)	52–66 (59.2±4.13)
<i>prasinorius</i>	30–37 (33.5±2.12)	6–8 (6.9±0.64)	104–132 (118.1±7.63)	32–48 (38.8±4.41)	48–91 (63.0±11.34)	32–47 (38.2±4.29)	46–61 (54.2±4.23)
<i>singularis</i>	36	8	129	58	66	46	56
<i>viridius</i>	35–46 (42.7±2.66)	7–9 (8.1±0.70)	110–140 (127.4±6.86)	42–56 (49.1±3.47)	90–94 (80.5±6.35)	36–46 (40.6±3.29)	55–73 (59.7±4.13)

Table 1 (continued).

Species	TL/ SVL	HL/ SVL	ShL/ SVL	HL/ HW	VDT/ HDT
<i>aliniger</i> ♂	1.30–1.70 (1.60±0.118)	0.25–0.32 (0.30±0.016)	0.02–0.26 (0.21±0.041)	1.61–2.21 (1.77±0.144)	0.87–1.30 (1.06±0.111)
<i>aliniger</i> ♀	1.37–1.67 (1.54±0.102)	0.27–0.32 (0.29±0.011)	0.19–0.23 (0.21±0.012)	1.62–1.97 (1.77±0.093)	0.84–1.33 (1.08±0.125)
<i>apletolepis</i> ♂	–	0.30–0.30 (0.30±0.006)	0.20–0.36 (0.28±0.116)	1.72–1.76 (1.74±0.034)	1.02–1.05 (1.04±0.020)
<i>apletolepis</i> ♀	–	0.29–0.30 (0.29±0.008)	0.20–0.20 (0.20±0.001)	1.78–1.78 (1.78±0.001)	–
<i>chlorocyanus</i> ♂	1.78–2.14 (1.97±0.103)	0.28–0.30 (0.29±0.006)	0.22–0.24 (0.23±0.007)	1.71–1.95 (1.83±0.074)	0.92–1.24 (1.00±0.096)
<i>chlorocyanus</i> ♀	1.80–2.07 (1.91±0.096)	0.28–0.30 (0.28–0.008)	0.21–0.24 (0.22±0.012)	1.76–2.00 (1.86±0.086)	0.82–1.08 (0.94±0.082)
<i>chlorodius</i> ♂	1.94–2.32 (2.10±0.106)	0.27–0.30 (0.29±0.007)	0.22–0.25 (0.24±0.009)	1.73–1.97 (1.86±0.069)	0.93–1.44 (1.06±0.117)
<i>chlorodius</i> ♀	1.96–2.22 (2.11±0.081)	0.28–0.30 (0.29±0.006)	0.22–0.24 (0.23±0.010)	1.84–1.96 (1.91±0.047)	0.90–1.47 (1.08±0.228)
<i>coelestinus</i> ♂	1.91–2.20 (2.08±0.092)	0.28–0.31 (0.29±0.010)	0.21–0.25 (0.23±0.008)	1.80–2.00 (1.88±0.065)	1.02–1.38 (1.14±0.087)
<i>coelestinus</i> ♀	1.89–2.28 (2.07±0.138)	0.28–0.30 (0.29±0.005)	0.20–0.24 (0.22±0.011)	1.72–2.07 (1.86±0.102)	0.90–1.21 (1.07±0.106)
<i>cyanostictus</i> ♂	1.84–2.00 (1.94±0.059)	0.28–0.30 (0.29±0.005)	0.21–0.23 (0.22±0.008)	1.75–2.11 (1.89±0.121)	0.83–1.10 (0.99±0.095)
<i>cyanostictus</i> ♀	2.23–2.23 (2.23)	0.28–0.33 (0.30±0.026)	0.21–0.25 (0.22±0.023)	1.76–1.78 (1.77±0.009)	1.07–1.08 (1.08±0.004)
<i>demissus</i> ♂	1.59–2.27 (1.90±0.345)	0.29 (0.29±0.004)	0.24–0.25 (0.25±0.001)	1.83–2.05 (1.92±0.112)	1.06–1.23 (1.16±0.092)
<i>demissus</i> ♀	–	–	–	–	–
<i>divius</i> ♂	1.54–1.66 (1.60±0.083)	0.29–0.30 (0.30±0.005)	0.22–0.23 (0.22±0.005)	1.76–1.84 (1.81±0.049)	1.00–1.07 (1.03±0.034)
<i>divius</i> ♀	–	0.27–0.29 (0.28±0.007)	0.21–0.23 (0.22±0.012)	1.69–1.72 (1.70±0.018)	1.00–1.03 (1.02±0.024)
<i>eladioi</i> ♂	1.54–1.76 (1.66±0.074)	0.29–0.32 (0.31±0.007)	0.20–0.25 (0.23±0.012)	1.72–1.93 (1.84±0.055)	0.89–1.36 (1.12±0.140)
<i>eladioi</i> ♀	1.23–1.79 (1.59±0.165)	0.27–0.32 (0.29±0.015)	0.18–0.25 (0.21±0.022)	1.75–1.90 (1.82±0.053)	0.98–1.29 (1.10±0.097)
<i>gonavensis</i> ♂	1.68	0.31	0.22	1.99	1.18
<i>gonavensis</i> ♀	1.60	0.29	0.21	1.88	1.31
<i>leucodera</i> ♂	1.91–2.11 (1.99±0.104)	0.28–0.30 (0.29±0.004)	0.22–0.24 (0.22±0.010)	1.73–1.93 (1.86±0.072)	0.75–1.02 (0.91±0.106)
<i>leucodera</i> ♀	–	0.27–0.30 (0.28±0.015)	0.21–0.22 (0.21±0.004)	1.84–1.90 (1.88±0.030)	0.91–1.03 (0.97±0.086)
<i>peccarius</i> ♂	1.78–2.04 (1.91±0.188)	0.27–0.32 (0.29±0.015)	0.23–0.26 (0.24±0.010)	1.71–1.95 (1.84±0.086)	0.92–1.46 (1.08±0.166)
<i>peccarius</i> ♀	–	–	–	–	–
<i>peynadoi</i> ♂	1.88–2.11 (1.97±0.088)	0.28–0.30 (0.29±0.006)	0.21–0.24 (0.22±0.012)	1.77–1.89 (1.85±0.045)	0.84–1.16 (1.02±0.111)
<i>peynadoi</i> ♀	1.87–2.33 (2.06±0.138)	1.87–2.33 (2.06±0.138)	0.27–0.30 (0.29±0.010)	0.21–0.24 (0.22±0.010)	1.72±1.88 (1.81±0.050)
<i>prasinorius</i> ♂	1.33–1.62 (1.54±0.140)	0.30–0.32 (0.31±0.010)	0.20–0.22 (0.21±0.010)	1.74–1.89 (1.82±0.055)	1.00–1.27 (1.13±0.104)
<i>prasinorius</i> ♀	1.47–1.61 (1.54±0.059)	0.27–0.29 (0.28±0.006)	0.18–0.23 (0.20±0.015)	1.73–1.93 (1.83±0.068)	0.92–1.40 (1.11±0.139)
<i>viridius</i> ♂	2.00–2.18 (2.09±0.064)	0.27–0.30 (0.29±0.007)	0.21–0.25 (0.24±0.012)	1.79–1.98 (1.86±0.058)	0.96–1.26 (1.07±0.102)
<i>viridius</i> ♀	1.92–2.38 (2.14±0.143)	0.27–0.30 (0.28±0.008)	0.22–0.26 (0.23±0.012)	1.69–1.97 (1.85±0.066)	0.92–1.29 (1.07±0.117)

Table 1 (continued).

Species	HW/ SVL	AGD/ SVL	ShL/ HL	SL/ SVL	SL/ HL
<i>alinger</i> ♂	0.13–0.19 (0.17±0.014)	0.28–0.43 (0.39±0.033)	0.07–0.81 (0.69±0.136)	0.12–0.16 (0.14–0.008)	0.45–0.52 (0.48±0.016)
<i>alinger</i> ♀	0.15–0.19 (0.17±0.012)	0.04–0.48 (0.41±0.106)	0.66–0.80 (0.71±0.046)	0.13–0.16 (0.14±0.006)	0.45–0.50 (0.47±0.013)
<i>apletolepis</i> ♂	0.17–0.17 (0.17±0.000)	0.36–0.44 (0.40±0.056)	0.66–1.19 (0.93±0.368)	0.15–0.16 (0.15±0.006)	0.50–0.51 (0.50±0.009)
<i>apletolepis</i> ♀	0.16–0.17 (0.16±0.005)	0.38–0.41 (0.39±0.021)	0.68–0.70 (0.69±0.017)	0.15–0.16 (0.15±0.010)	0.50–0.56 (0.53±0.048)
<i>chlorocyanus</i> ♂	0.15–0.17 (0.16±0.009)	0.36–0.42 (0.39±0.017)	0.75–0.82 (0.79±0.025)	0.13–0.15 (0.14±0.006)	0.47–0.54 (0.50±0.019)
<i>chlorocyanus</i> ♀	0.14–0.17 (0.15±0.010)	0.36–0.47 (0.41±0.030)	0.73–0.84 (0.77±0.035)	0.13–0.15 (0.14±0.007)	0.48–0.51 (0.49±0.013)
<i>chlorodius</i> ♂	0.14–0.17 (0.16±0.008)	0.35–0.44 (0.40±0.027)	0.78–0.89 (0.82±0.031)	0.13–0.15 (0.14±0.006)	0.46–0.51 (0.48±0.014)
<i>chlorodius</i> ♀	0.14–0.16 (0.15±0.006)	0.36–0.45 (0.41±0.036)	0.77–0.87 (0.81±0.039)	0.13–0.14 (0.13±0.003)	0.45–0.50 (0.47±0.015)
<i>coelestinus</i> ♂	0.14–0.18 (0.16±0.008)	0.40–0.46 (0.42±0.015)	0.73–0.86 (0.78±0.032)	0.13–0.15 (0.14±0.005)	0.46–0.50 (0.48±0.009)
<i>coelestinus</i> ♀	0.14–0.17 (0.15±0.008)	0.41–0.47 (0.44±0.018)	0.69–0.81 (0.76±0.038)	0.13–0.15 (0.14±0.005)	0.44–0.49 (0.47±0.014)
<i>cyanostictus</i> ♂	0.14–0.16 (0.15±0.009)	0.33–0.42 (0.38±0.032)	0.70–0.80 (0.77±0.032)	0.13–0.15 (0.14±0.006)	0.46–0.51 (0.49±0.013)
<i>cyanostictus</i> ♀	0.16–0.18 (0.17±0.016)	0.38–0.44 (0.41±0.027)	0.75–0.77 (0.76±0.012)	0.13–0.16 (0.15±0.009)	0.48–0.52 (0.49±0.021)
<i>demissus</i> ♂	0.14–0.16 (0.15±0.008)	0.38–0.43 (0.40±0.025)	0.83–0.86 (0.84±0.015)	0.14–0.15 (0.14±0.008)	0.48–0.52 (0.49±0.023)
<i>demissus</i> ♀	–	–	–	–	–
<i>divius</i> ♂	0.16–0.17 (0.17±0.007)	0.38–0.40 (0.39±0.008)	0.73–0.75 (0.74±0.011)	0.14–0.15 (0.15–0.005)	0.47–0.50 (0.49±0.014)
<i>divius</i> ♀	0.16–0.17 (0.16±0.003)	0.36–0.43 (0.40±0.034)	0.75–0.82 (0.79±0.035)	0.13–0.14 (0.14–0.004)	0.48–0.50 (0.49±0.010)
<i>eladioi</i> ♂	0.16–0.18 (0.17±0.006)	0.35–0.42 (0.39±0.024)	0.67–0.80 (0.74±0.038)	0.14–0.16 (0.15±0.006)	0.47–0.51 (0.49±0.012)
<i>eladioi</i> ♀	0.15–0.18 (0.16±0.011)	0.39–0.49 (0.42±0.036)	0.63–0.82 (0.72±0.058)	0.13–0.16 (0.14±0.011)	0.46–0.50 (0.48±0.017)
<i>gonavensis</i> ♂	0.16	0.36	0.71	0.16	0.50
<i>gonavensis</i> ♀	0.16	0.40	0.72	0.15	0.50
<i>leucodera</i> ♂	0.15–0.17 (0.16±0.007)	0.38–0.42 (0.41±0.018)	0.74–0.83 (0.77±0.033)	0.14–0.15 (0.14±0.004)	0.48–0.51 (0.50±0.009)
<i>leucodera</i> ♀	0.15–0.16 (0.15±0.006)	0.43 (0.43±0.002)	0.73–0.78 (0.75±0.028)	0.14–0.15 (0.14±0.007)	0.50 (0.50±0.004)
<i>peccarius</i> ♂	0.15–0.17 (0.16±0.010)	0.37–0.45 (0.42±0.027)	0.81–0.86 (0.83±0.020)	0.13–0.16 (0.14±0.010)	0.47–0.51 (0.49±0.013)
<i>peccarius</i> ♀	–	–	–	–	–
<i>peynadai</i> ♂	0.15–0.16 (0.16±0.006)	0.38–0.43 (0.40±0.014)	0.71–0.82 (0.77±0.034)	0.14–0.15 (0.14±0.003)	0.49–0.51 (0.50±0.008)
<i>peynadai</i> ♀	0.90–1.07 (0.99±0.049)	0.15–0.17 (0.16±0.006)	0.45–1.42 (0.87±0.345)	0.14–0.17 (0.15±0.009)	0.50–0.58 (0.54±0.030)
<i>prasinorius</i> ♂	0.17–0.18 (0.17±0.004)	0.34–0.40 (0.38±0.018)	0.63–0.70 (0.67±0.028)	0.14–0.16 (0.15±0.007)	0.48–0.51 (0.49±0.01)
<i>prasinorius</i> ♀	0.15–0.17 (0.16±0.006)	0.39–0.44 (0.42±0.017)	0.61–0.83 (0.70±0.062)	0.13–0.15 (0.14±0.006)	0.46–0.51 (0.49±0.02)
<i>viridius</i> ♂	0.14–0.16 (0.15±0.006)	0.34–0.41 (0.38±0.022)	0.72–0.88 (0.82±0.046)	0.13–0.15 (0.14–0.007)	0.46–0.52 (0.49±0.016)
<i>viridius</i> ♀	0.14–0.17 (0.15±0.007)	0.35–0.45 (0.40±0.033)	0.77–0.92 (0.81±0.042)	0.13–0.14 (0.14±0.005)	0.44–0.54 (0.48±0.025)

Anolis coelestinus Cope, 1862.

Figs. 7–9

Anolis coelestinus Cope, 1862: 177; type locality: “Western Hayti... near Jérémie”. Lectotype: MCZ 3347. Garman, 1887; Barbour, 1914 (in part.), 1930, 1935, 1935, 1937; Cochran, 1941 (in part.); Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Ramos & Powell, 2001b (in part.); Henderson & Powell, 2009 (in part.).

Anolis bullaris: Gray, 1845 (in part.).

Anolis chlorocyanus: Boulenger, 1885 (in part.); Barbour, 1914 (in part.).

Anolis latirostris Schmidt, 1919; type locality: Navassa Island (in error fide Thomas, 1966). Holotype: AMNH 12598.

Dactyloa chlorocyanana: Fitzinger, 1843.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. demissus* and *A. pecuarius* and two species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) a white subocular stripe that continues as a white streak onto lateral neck (3) hind legs relatively short (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) ventral scales at midbody usually faintly to distinctly keeled; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species treated in this contribution, *A. coelestinus* is most similar to *A. demissus*, *A. pecuarius*, and two species described below. *Anolis coelestinus* differs from *A. demissus* and *A. pecuarius* by (1) usually having a white subocular stripe and a white streak on lateral neck and shoulder (vs. such a pattern usually not present in *A. demissus* and *A. pecuarius*); a bluish green to yellowish green male dewlap in life (vs. yellowish brown, dark gray, or greenish gray in *A. demissus* and *A. pecuarius*); and (3) by usually having a pattern of white to pale green vertical bars or blotches on flanks (vs. usually lacking any pattern on flanks in *A. demissus* and *A. pecuarius*). *Anolis coelestinus* further differs from *A. demissus* by usually having 4 supracaudals per caudal segment, either throughout all discernable segments or having the reduction from 5 to 4 supracaudals per segment before the 5th segment (vs. 5 supracaudals per caudal segment throughout all discernable segments in *A. demissus*) and by usually having weakly to distinctly keeled ventral scales (vs. usually smooth in *A. demissus*). *Anolis coelestinus* differs from *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* by having (1) a yellowish green or brown (after metachrosis) in life dewlap with longitudinal or oblique double rows of gorgetal scales (vs. dewlap bicolored with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales); (2) and a blue iris in life (vs. brown to reddish brown). *Anolis coelestinus* differs further from *A. cyanostictus* (1) by having a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak in *A. cyanostictus*) and (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis coelestinus* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. coelestinus* and the species described below, see the respective accounts of the new species.

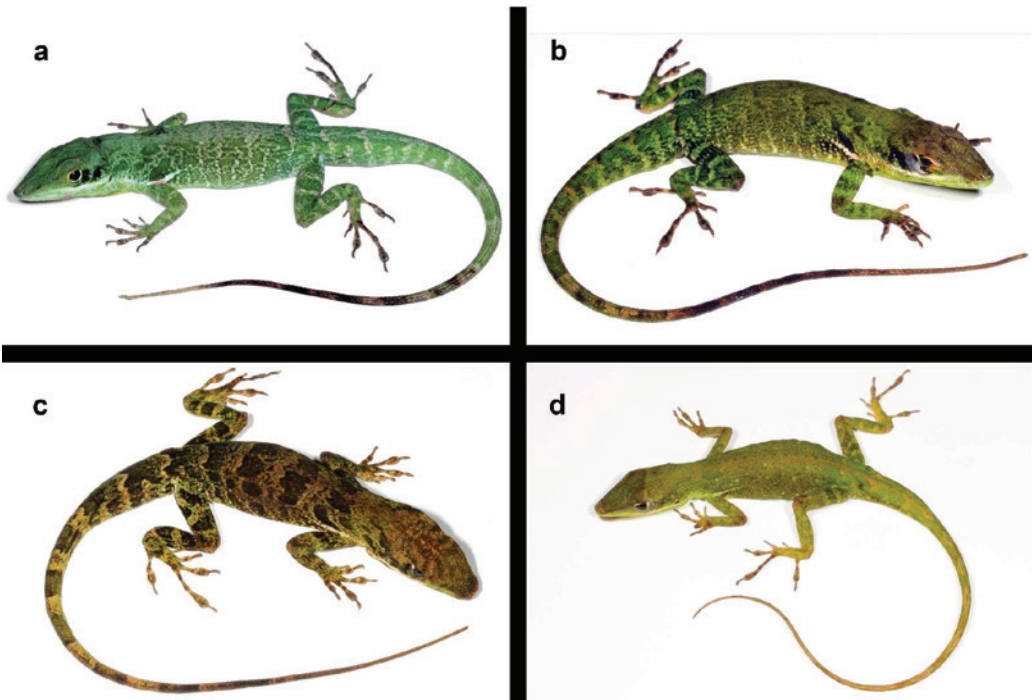


Figure 7. *Anolis coelestinus* in life (all males). (a) USNM 329069; (b) SMF 98153; (c) SMF 98157; (d) SMF 98155.

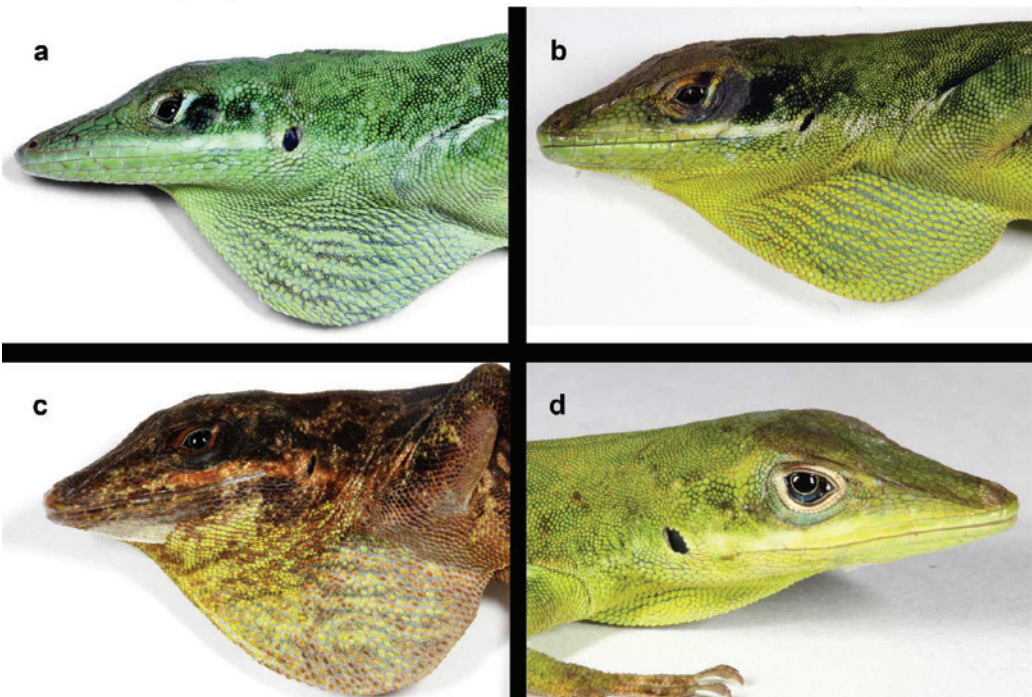


Figure 8. Dewlaps of *Anolis coelestinus* in life (all males). (a) USNM 329070; (b) SMF 98153; (c) USNM 558696; (d) SMF 98155. Photos by S.B.H.

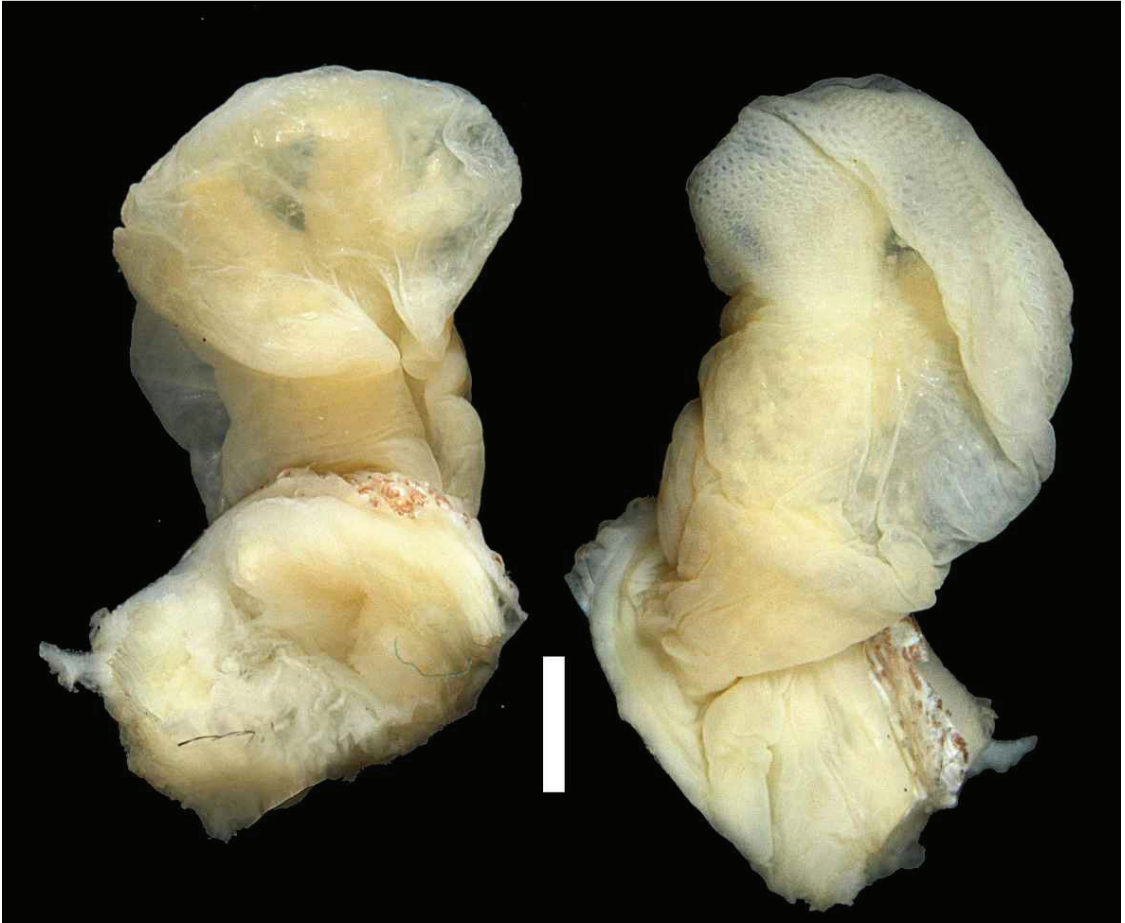


Figure 9. Hemipenis of *Anolis coelestinus* (USNM 558699). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

Description. *Anolis coelestinus* is a moderate-sized to moderately large anole (maximum recorded SVL 77.0 mm in males, 56.0 in females); dorsal head scales in internasal region keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 5 to 7 postrostrals; 6 to 9 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 to 2 scale rows at narrowest point; supraorbital disc composed of 2 to 6 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 complete row of circumorbital scales usually present, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate to deep parietal depression present; interparietal scale well developed, slightly to considerably larger than ear opening, surrounded by scales of moderate size; 2 to 4 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 9 to 15 scales present between second canthals; 9 to 15 scales present between posterior canthals; 18 to 43 mostly keeled loreal scales in a maximum of 4 to 6 horizontal rows; 4 to 5 keeled subocular scales arranged in a single row; 6 to 9 supralabials to

level below center of eye; 4 to 7 suboculars broadly in contact with 4 to 6 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 to 8 postmentals, outer ones slightly larger than median ones; 5 to 9 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small, 105 and 112 mm², respectively in two adult males, SMF 98153 and USNM 558695, extending from level below anterior margin of eye to level of axilla; 4–5 horizontal gorgetal–sternal double rows of irregular small scales among more regular larger gorgetals; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 44 to 62 medial dorsal scales in one head length; 71 to 103 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size; ventrals at midbody subimbricate and usually faintly to distinctly keeled, occasionally smooth; about 34 to 54 medial ventral scales in one head length; 52 to 78 medial ventral scales between levels of axilla and groin; 114 to 140 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.016–0.031; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 38 to 45 lamellae under phalanges II–IV of Toe IV of hind limbs; 7 to 10 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

The incompletely everted hemipenis (of USNM 558699; Fig. 9) is a moderate-sized, unilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single apical field void of ornamentation; apex strongly calyculate, truncus with transverse folds.

Geographic distribution. As currently known, *Anolis coelestinus* occurs on the western portion of the Tiburón Peninsula along the northern coast to the region of Trou Caiman, Département d'Ouest, Haiti, from near sea level to about 1500 masl (Fig. 10).

Natural history notes. *Anolis coelestinus* seems to be quite adaptable in regard of the tolerated habitats and even seems to prefer disturbed habitat, forest edges, and villages (Fig. 10). At night these lizards sleep on leaf and twigs 2 to 4 m above the ground. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis coelestinus*” which under our concept is represented by three species (i.e., *A. coelestinus* and two species described below).

Conservation. Given its broad range and usual abundance wherever this species occurs, we consider the conservation status of *Anolis coelestinus* as Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).

Remarks. As noted above, the type locality for *Anolis coelestinus* is imprecise (Martinique and Hispaniola) and we only know for certain that it came from the latter island because this complex of green anoles does not occur in the Lesser Antilles. However, the scalation of the lectotype indicates that it is a species known only to occur in Haiti, on the Tiburón Peninsula and extending eastward to the region of Port-au-Prince. This is also consistent with the type material originating from a French Naval Surgeon and collector, Alexandre Ricord, and described by French herpetologists (Duméril & Bibron, 1837). Ricord was mentioned by name in the original description, and his collections in the New World are known to have taken place in 1826–1834 (Beolens *et al.*, 2011), which restricts the date of collection of this species.

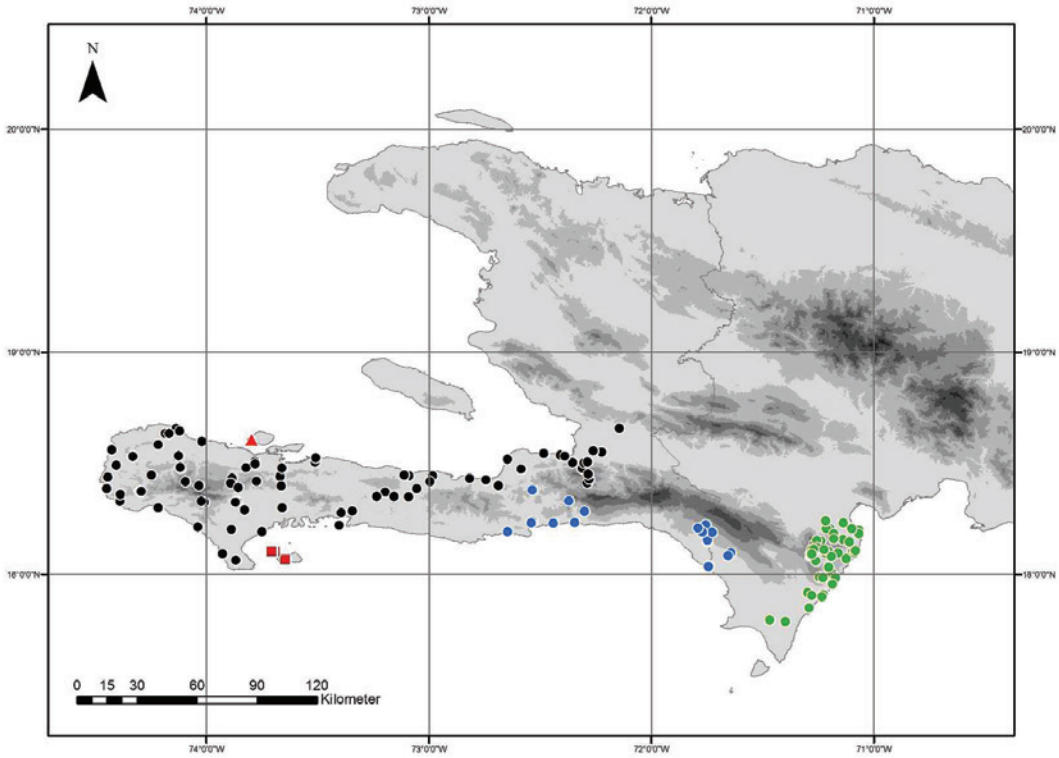


Figure 10. Map indicating collecting localities of the species in the *Anolis coelestinus* species group. Each symbol can represent one or more adjacent localities. Areas above 500 and 1000 m are shaded medium dark and dark gray, respectively. Black circles: *Anolis coelestinus*; blue circles: *A. chlorodius* sp. nov.; green circles: *A. viridius* sp. nov.; red squares: *A. pecuarius*; red triangles: *A. demissus*.



Figure 11. Habitat of *Anolis coelestinus* in remnant cloud forest at Morne Bois Pangnol (18.41869, -73.77512, 1170 m), Département des Nippes, Haiti. Photo by S.B.H. on 20 June 2012.

The French influence on the island has been mostly in the western one-third (now Haiti), except for relatively short periods of occupation of the east. Within the range of the species, the most likely location where the types were collected was the major city, Port-au-Prince, Haiti, although Jérémie and Les Cayes are other possibilities.

Specimens examined. Haiti. Grand'Anse: 3.95 km WSW Annette: SMF 98150–51; 16.8 km S Pestel: SMF 98143; 2 km NW Jérémie: KU 252846; 4.8 km N Les Irois: 100 m: SMF 98144 (KJ566820, EF531473), USNM 558691; 5.8 km S Pestel, 375 m: SMF 98138 (KJ566818), SMF 98139 (KJ566819), SMF 98140–42, USNM 558685–86; 5.9 km E Anse D'Hainault: 175 m: USNM 558692 (KJ566821, KJ566888); 7.0 km S Pestel: USNM 558687–90; 7.5 km (airline) WSW Moron: KU 252844; 8 km S (airline) Marché Léon: KU 252678–79; 8.0 km SSW Baraderes, 420 m: USNM 558693 (KJ566822), USNM 558694; Baraderes, 10 mi E of: USNM 80761; Carrefour Sanon, near Jérémie: MCZ R-69674; Castillon, S Marché Léon: KU 252681–82; Dame Marie, along coast, S side town: KU 252845; Fond des Negres: USNM 72626–27, 72634; Jérémie: KU 252837–38; Les Roseaux, near Jérémie: MCZ R-74667; Marfranc, near Jérémie: MCZ R-74673, R-74675, R-74685, R-74688, R-74694; Place Negre, near Jérémie: MCZ R-64591, R-64603, R-64619, R-64628; Pourcine: MCZ R-119279, R-119281, R-119287, R-119300; Rampe des Lions: KU 252680; Tozia near Jérémie: MCZ R-69739; Nippes: 2.4 mi SE Carrefour Moussignac: KU 252938–39; 4.7 mi SW Paillant: KU 252793–94; Étang de Miragoâne: KU 252718–19; Fond des Negres, near Miragoâne: MCZ R-66099; Miragoâne: SMF 10956; Miragoâne: USNM 117185–86; Morne Bois Pangnol, 1170 m: SMF 98155 (KJ566854), SMF 98156–57, USNM 558695–98; Petit Trou de Nippes: USNM 80809–10; Saint Croix, 7–8 mi NE Paillant: MCZ R-132904–05, R-132911, R-132913, R-132925; Ouest: 1 km W Fauche: KU 252899–900; 3 mi W Grand Goave: KU 252677; 3.5 mi NW Trouin: KU 252651–52; 4 mi SE Léogâne: KU 252835; 5 km SW Petionville: KU 252831; 7.1 mi E Miragoâne: KU 252722; Botillier, ca. 7 km W Petionville: USNM 239376–77; btw. Petionville and Kenscoff: FMNH 13230; btw. Port-au-Prince and Léogâne: FMNH 60236; Carrefour: AMNH 22605; Chateau Blanc, 5 mi NE Petionville: KU 252833; Chontal Leveille, NW of Cayes (probably Chantal): AMNH 69031; Diquini: FMNH 13276–77; Diquini: KU 252676; Farcy: MCZ R-63524; Furcy: AMNH 70965; Ira, near Léogâne: MCZ R-64875, R-64884, R-64886; Kenscoff, 1500 m: FMNH 208932; Morne Calvaire, 1 mi SW Petionville: KU 252663–64; Petionville: KU 252672–73, 252818; Port-au-Prince: AMNH 22604; Quiperie, Lac Miragoâne: USNM 195968; Trou Caiman: USNM 118897; Sud: 1 km NE Tiburón: USNM 558699; 1 mi S Vieux Bourg d'Aquin: KU 252933–35; 1.5 km N Carcasse: USNM 558701; 11 km N Cavaillon: KU 252873–74; 12.4 mi N Cavaillon: KU 252940–41; 13.5 km N Camp Perrin: USNM 329072 (KJ566811, EF531474), USNM 329073 (KJ566812); 28 km S Duchity: MCZ R-124694, R-124696, R-124698; 3.5 mi SW Saint Michel du Sud: KU 252720–21; 4.5 mi N Camp Perrin: KU 252951–52; 7.2 km ENE Port-Salut: KU 252868; Aquin: KU 252709–10; Aux Cayes: MCZ R-62858; Camp Perrin: KU 252851–52; Camp Perrin: MCZ R-62875; Cavaillon: KU 252875–76; Debouche: SMF 98146; Grosse Caye, S Aquin: KU 252723; Les Anglais: Sud: MCZ R-125813; Les Cayes: KU 252869–70, USNM 80917, 82566; Morne Deux Mamelles: SMF 98153, USNM 558706; Morne Grand Bois: SMF 98152, USNM 558707; Morne Grand Bois, E slope, 1100 m: SMF 98159–66, USNM 558709–10), USNM 558711 (KJ566859), USNM 558712 (KJ566858, KJ566905); Morne Grand Bois, vicinity of campsite and helipad: SMF 98158, USNM 558708; Morne Mansinte, forest in vicinity of peak, 1088 m: SMF 98167 (KJ566856, KJ566904), USNM 558713 (KJ566857); near Coteau: SMF 98145, 98147, USNM 558700; Plaine Formon, Caye Madeline: USNM 558705; Plaine Formon, Caye Michel: SMF 98148–49, USNM 558702–04.

Anolis demissus Schwartz, 1969

Figs. 12–13

Anolis coelestinus demissus Schwartz, 1969: 35; type locality: “vicinity of Pointe Sable, Ile Grande Cayemite, Haiti”. Holotype: MCZ 92049. Schwartz & Thomas, 1975; Schwartz, 1980 (in part.); Schwartz & Henderson, 1988; Schwartz & Henderson, 1991; Ramos & Powell, 2001b; Henderson & Powell, 2009.

Anolis coelestinus: Williams, 1965 (in part.); Powell *et al.*, 1996 (in part.)

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. coelestinus* and *A. pecuarius* and two species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) white subocular stripe that continues as a white streak onto lateral neck usually absent (3) hind legs relatively short (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) ventral scales at midbody usually faintly to distinctly keeled; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species treated here, *A. demissus* is most similar to *A. coelestinus*, *A. pecuarius*, and two species described below. *Anolis demissus* differs from *A. coelestinus* by (1) usually not having a white subocular stripe and white streak above shoulder (vs. such a pattern usually present in *A. coelestinus*); (2) a dark gray to greenish gray male dewlap in life (vs. some shade of green in *A. coelestinus*); and (3) by lacking any pattern on flanks (vs. usually a pattern of pale green vertical bars or blotches present in *A. coelestinus*); (4) 5 supracaudals per caudal segment throughout all discernable segments (vs. 4 supracaudals per caudal segment, either throughout all discernable segments or having the reduction from 5 to 4 supracaudals per segment before the 5th segment); (3) usually smooth ventral scales (vs. usually weakly to distinctly keeled). *Anolis demissus* further differs from *A. pecuarius* by having a dark gray to greenish gray male dewlap in life (vs. yellowish green to yellowish brown in *A. pecuarius*). *Anolis demissus* differs from *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* by having (1) a yellowish green or brown (after metachrosis) in life dewlap with longitudinal or oblique double rows of gorgetal scales (vs. dewlap bicolored with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales); (2) and a blue iris in life (vs. brown to reddish brown). *Anolis demissus* differs further from *A. cyanostictus* (1) by having a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak in *A. cyanostictus*) and (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis demissus* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. demissus* and the species described below, see the respective accounts of the new species.

Description. *Anolis demissus* is a moderate-sized to moderately large anole (largest male examined by us 77.0 mm, maximum recorded SVL 77.0 mm in males, 53 mm in females; Schwartz, 1969); dorsal head scales in internasal region keeled, uncarinate; other dorsal head scales smooth, rugose, or keeled; 8 postrostrals; 8 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first

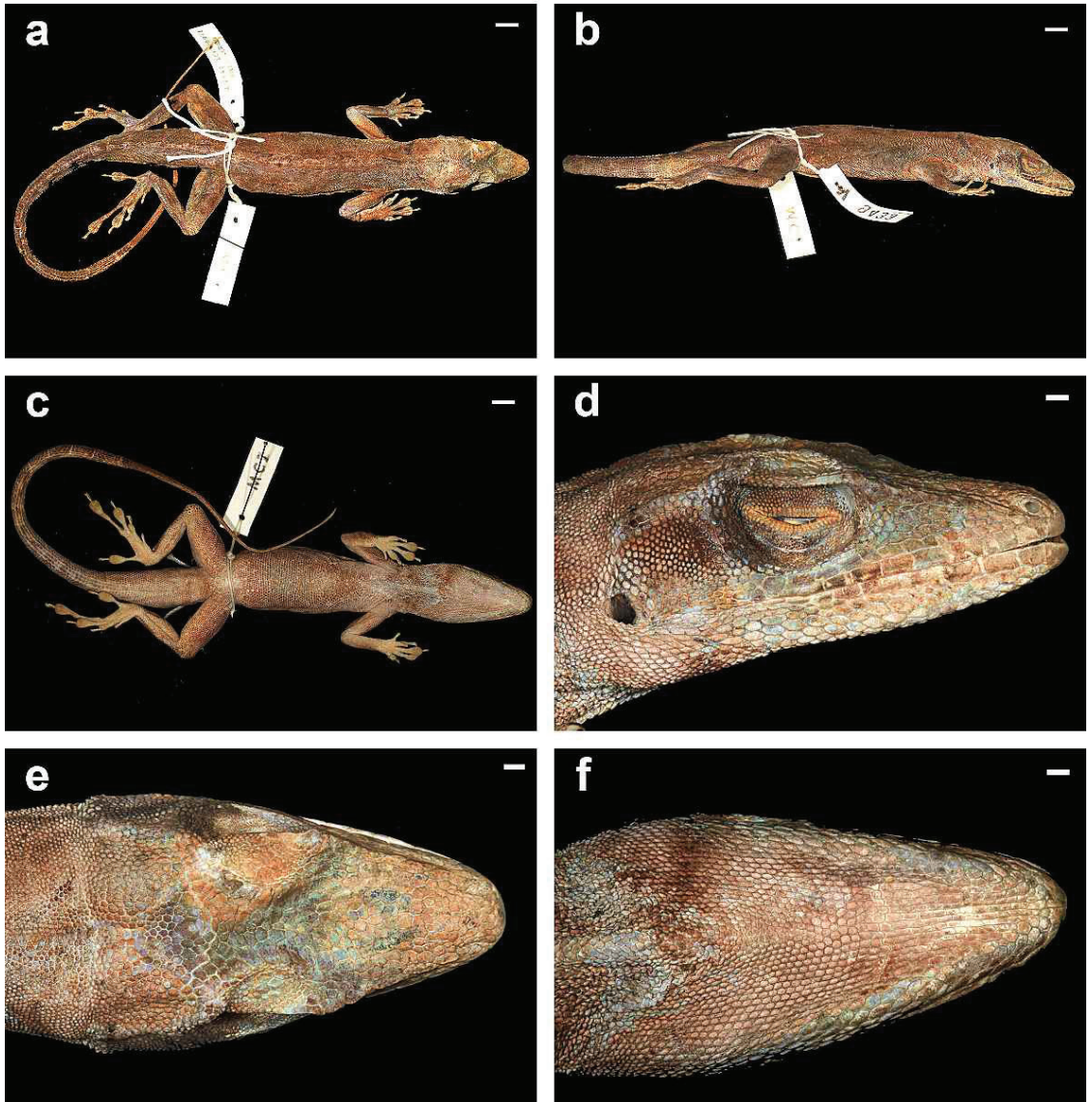


Figure 12. Holotype of *Anolis demissus* (MCZ 92049). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

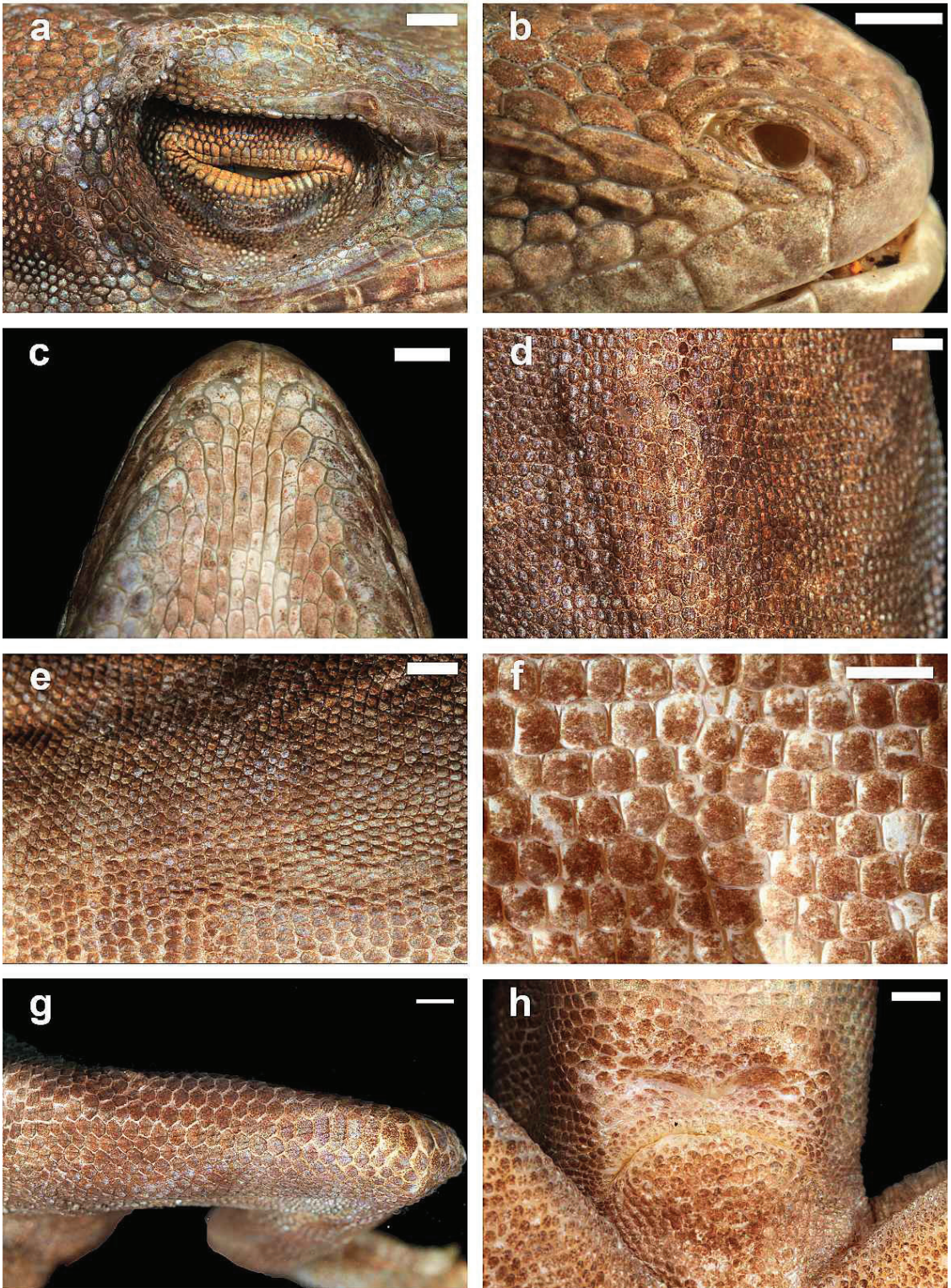


Figure 13. Holotype of *Anolis demissus* (MCZ 92049). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 2 scale rows at narrowest point; supraorbital disc composed of 3 to 4 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 complete row of circumorbital scales usually present, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate to deep parietal depression present; interparietal scale well developed, usually slightly larger than ear opening, surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 9 to 10 scales present between second canthals; 13 scales present between posterior canthals; 30 to 35 mostly keeled loreal scales in a maximum of 5 horizontal rows; 4 to 5 keeled subocular scales arranged in a single row; 8 supralabials to level below center of eye; 4 to 5 suboculars broadly in contact with 5 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 postmentals, outer ones slightly larger than median ones; 7 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; 4–5 horizontal gorgetal–sternal double rows of irregular small scales among more regular larger gorgetals; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 52 to 54 medial dorsal scales in one head length; about 79 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size; ventrals at midbody subimbricate and usually faintly to distinctly keeled, occasionally smooth; about 40 to 44 medial ventral scales in one head length; 64 to 72 medial ventral scales between levels of axilla and groin; 128 to 140 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.024–0.027; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 42 to 43 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

Geographic distribution. As currently known, *Anolis demissus* is restricted to Île Grande Cayemite, Haiti (Fig. 10).

Natural history notes. In June, 2012, SBH visited Île Grande Cayemite but did not encounter individuals of *Anolis demissus* despite seemingly suitable habitat (Fig. 14). Tree-cutting and charcoaling were ongoing at that time, in the most remote parts of the island (north and northwest slopes). During that trip, the species was also not encountered by the same team on Petite Cayemite.

Conservation. Given its small geographic range, degraded habitat, and threat from deforestation, we consider the conservation status of *Anolis demissus* as Critically Endangered based on criterion B1ab(iii) of the IUCN Red List Categories and Criteria (IUCN, 2012).

Specimens examined. Haiti. Grand'Anse: Île Grande Cayemite: MCZ R-25483; Île Grande Cayemite, vicinity of Pointe Sable: KU 252633, MCZ R-92049.



Figure 14. Presumed dry forest habitat of *Anolis demissus* on Grande Cayemite (18.63316, -73.75524, 74 m), Département de la Grand'Anse, Haiti. Photo by S.B.H. on 19 June 2012.

Anolis pecuarius Schwartz, 1969

Figs. 15–17

Anolis coelestinus pecuarius Schwartz, 1969: 34; type locality: “Western end, Ile-à-Vache, Haiti”. Holotype: MCZ 81141. Schwartz & Thomas, 1975; Schwartz, 1980 (in part.); Schwartz & Henderson, 1988; Schwartz & Henderson, 1991; Ramos & Powell, 2001b; Henderson & Powell, 2009.

Anolis coelestinus: Williams, 1965 (in part.); Powell *et al.*, 1996 (in part.).

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. coelestinus* and *A. demissus* and two species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) white subocular stripe that continues as a white streak onto lateral neck usually absent (3) hind legs relatively short (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) ventral scales at midbody usually faintly to distinctly keeled; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species occurring treated in this contribution, *A. pecuarius* is most similar to *A. coelestinus*, *A. demissus*, and two species described below. *Anolis pecuarius* differs from *A. coelestinus* by (1) usually not having a white subocular stripe and no a white streak above shoulder (vs. such a pattern usually present in *A. coelestinus*); (2) a yellowish brown male dewlap in life (vs. some shade of green in *A. coelestinus*); and (3) by lacking any pattern on flanks (vs. usually a pattern

of pale green vertical bars or blotches present in *A. coelestinus*). *Anolis pecuarius* differs from *A. demissus* by having (1) a yellowish brown male dewlap in life (vs. dark gray to greenish gray in *A. demissus*); (2) 4 supracaudals per caudal segment, either throughout all discernable segments or having the reduction from 5 to 4 supracaudals per segment before the 5th segment (vs. 5 supracaudals per caudal segment throughout all discernable segments in *A. demissus*); (3) usually weakly to distinctly keeled ventral scales (vs. usually smooth in *A. demissus*). *Anolis pecuarius* differs from *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* by having (1) a yellowish green or brown (after metachrosis) in life dewlap with longitudinal or oblique double rows of gorgetal scales (vs. dewlap bicolored with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales); (2) and a blue iris in life (vs. brown to reddish brown). *Anolis pecuarius* differs further from *A. cyanostictus* (1) by having a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak in *A. cyanostictus*) and (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis pecuarius* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. chlorocyanus* and the species described below, see the respective accounts of the new species.

Description. *Anolis pecuarius* is a moderate-sized to moderately large anole (largest male examined by us 72.5 mm, maximum recorded SVL 78.0 mm in males, 55 mm in females; dorsal head scales in internasal region keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 5 to 7 postrostrals; 7 to 9 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 to 2 scale rows at narrowest point; supraorbital disc composed of 2 to 5 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 complete row of circumorbital scales usually present, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate to deep parietal depression present; interparietal scale well developed, slightly to considerably larger than ear opening, surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 10 to 13 scales present between second canthals; 11 to 13 scales present between posterior canthals; 33 to 46 mostly keeled loreal scales in a maximum of 5 to 6 horizontal rows; 5 or 6 keeled subocular scales arranged in a single row; 7 to 8 supralabials to level below center of eye; 5 to 6 suboculars broadly in contact with 5 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 to 8 postmentals, outer ones slightly larger than median ones; 7 to 8 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; 4–5 horizontal gorgetal–sternal double rows of irregular small scales among more regular larger gorgetals; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 44 to 64 medial dorsal scales in one head length; 83 to 88 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size; ventrals at midbody subimbricate and usually faintly to distinctly keeled, occasionally smooth; about 34 to 46 medial ventral scales in one head length; 62 to 71 medial ventral scales between levels of axilla and groin;

122 to 156 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.019–0.025; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 38 to 44 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 to 9 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

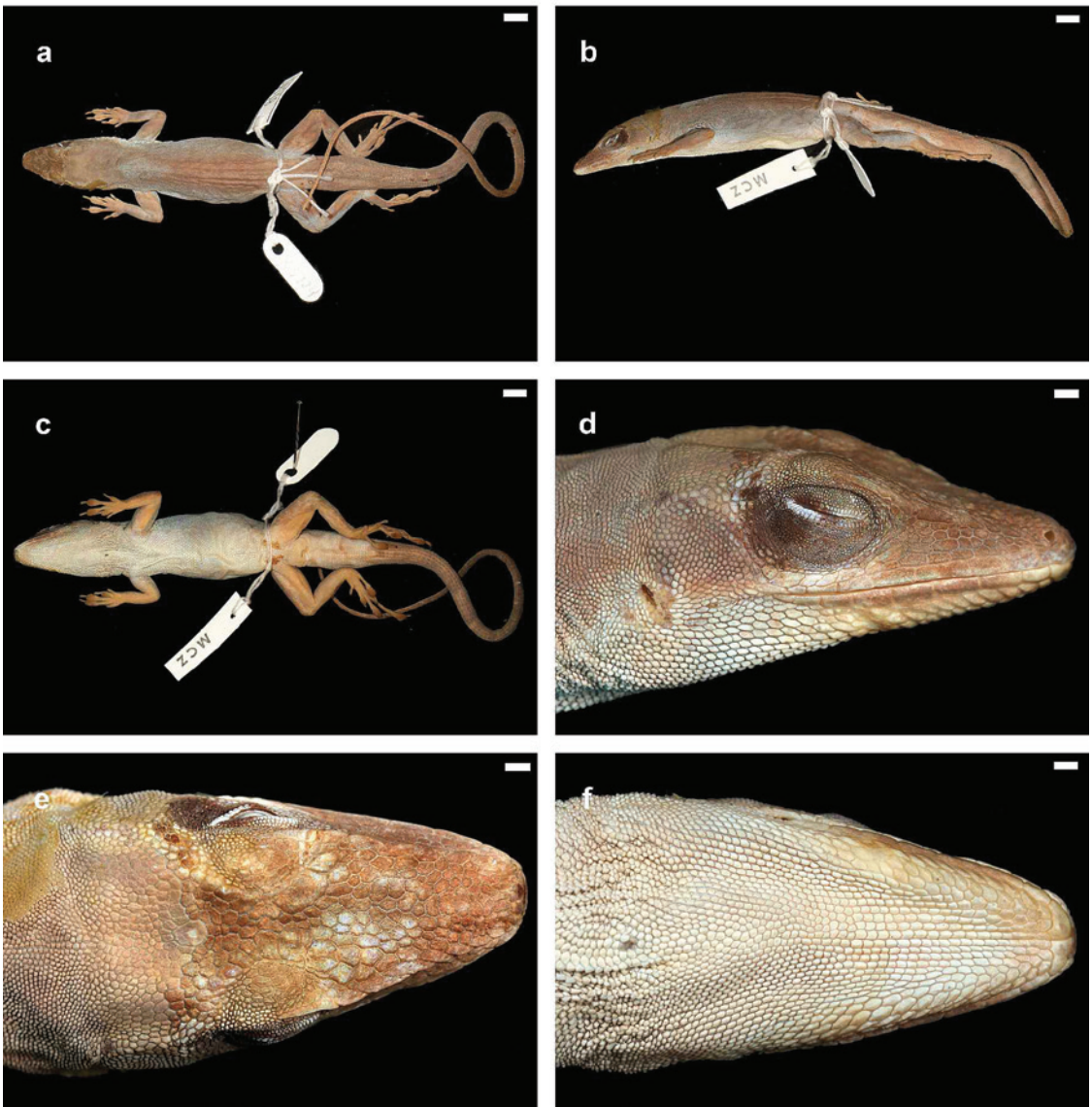


Figure 15. Holotype of *Anolis pecuarius* (MCZ 81141). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

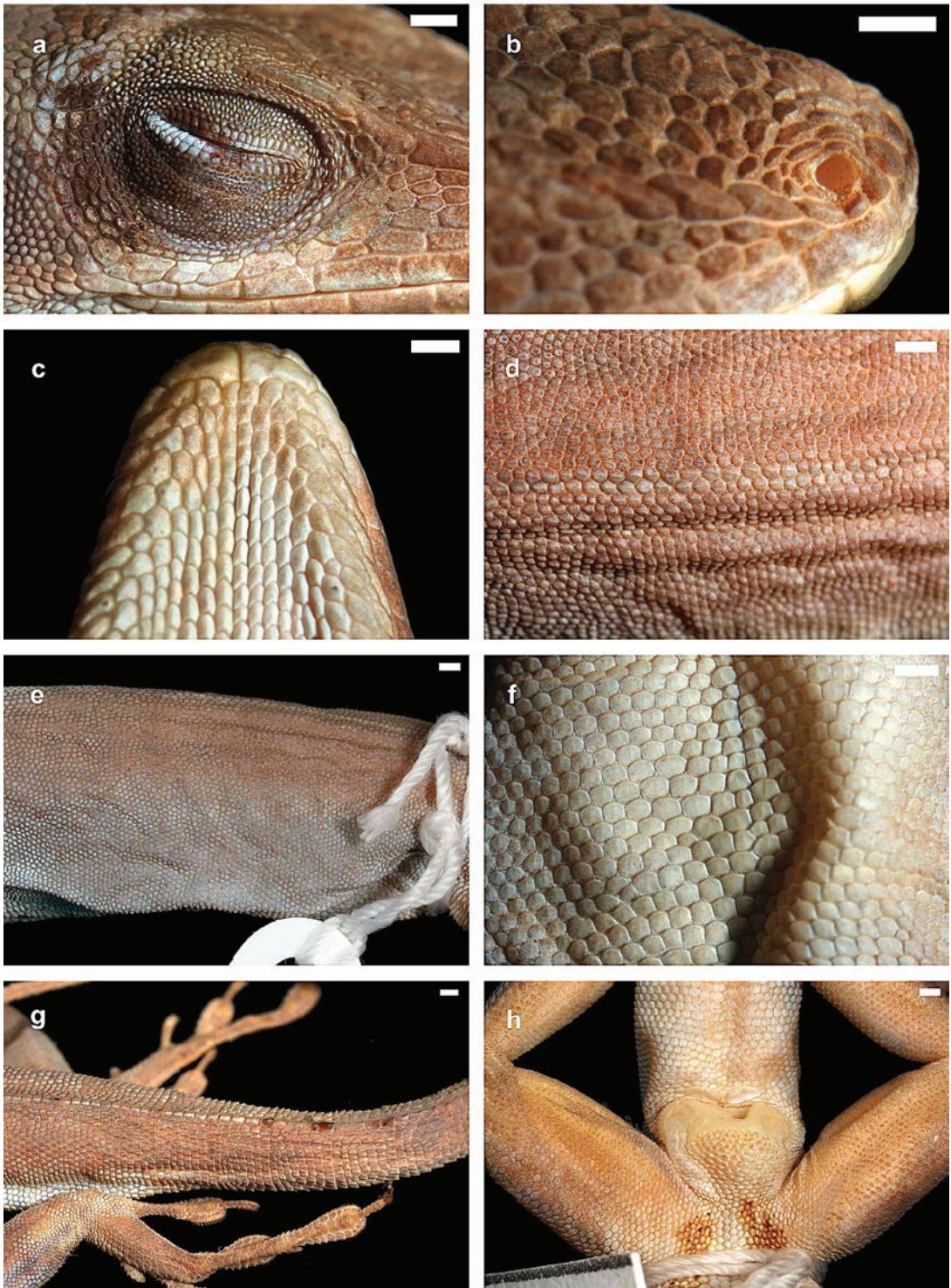


Figure 16. Holotype of *Anolis pecuarius* (MCZ 81141). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

Geographic distribution. As currently known, *Anolis pecuarius* is restricted to Île-à-Vache, Haiti (Fig. 10), which has a total area of only 52 km².

Natural history notes. SBH collected *Anolis pecuarius* on Île-à-Vache mostly in disturbed habitat of a hotel complex (Fig. 18). However, habitats elsewhere are even more disturbed, from deforestation, and appeared drier. Although it probably occurs elsewhere on the island, its preference for trees and moisture would likely limit its distribution.

Conservation. Anecdotal observations at the northwest end of the island by SBH suggest that the species is at least locally abundant in the mesic environs of a hotel complex, but the island has undergone extensive deforestation, and habitat destruction is continuing. Given the small range size and ongoing threats, we consider the conservation status of *Anolis pecuarius* to be Critically Endangered based on criterion B1ab (iii) of the IUCN Red List Categories and Criteria (IUCN 2012).

Specimens examined. Haiti. Sud: Île-à-Vache: MCZ R-171464–65, 37421, 37423–25, 37427, 37429–30, SMF 98176 (KJ566843), 98191–92, USNM 558725; Île-à-Vache, W end: KU 252634–35, MCZ R-92056–58, USNM 160726–30; Île-à-Vache, at Port Morgan Hotel: USNM 558724.

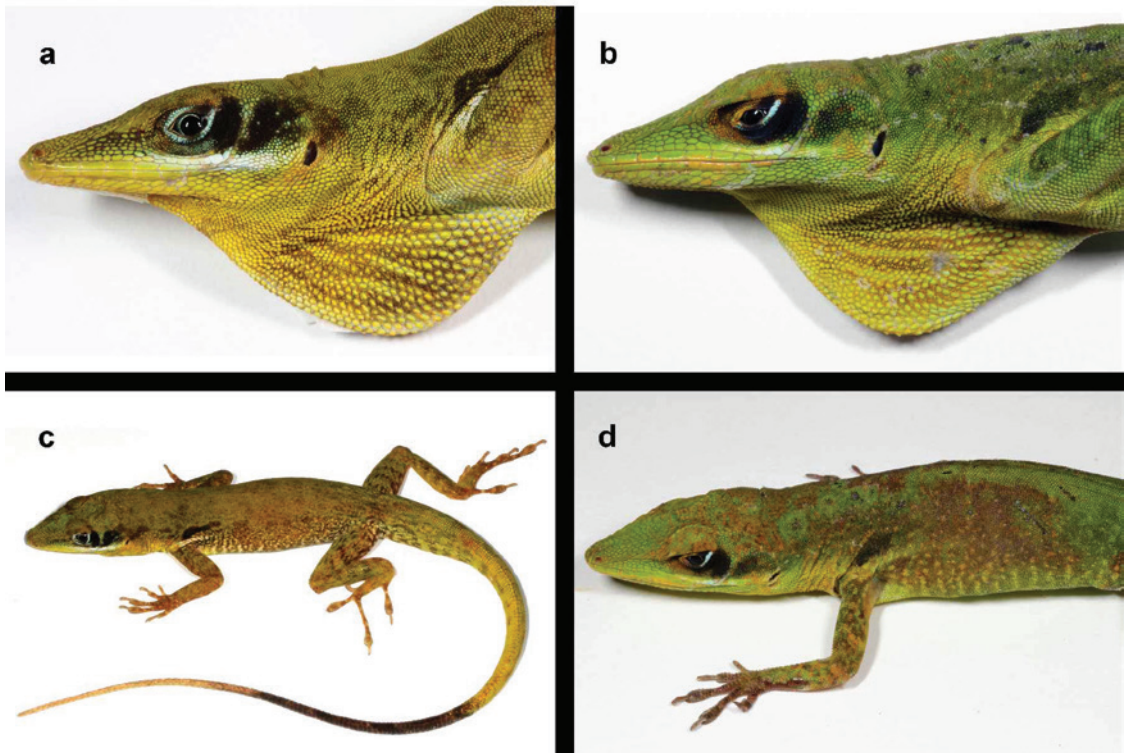


Figure 17. *Anolis pecuarius* in life (all males). (a) SBH 274229; (b) SMF 98192; (c) SBH 274229; (d) SMF 98192. Photos by S.B.H.



Figure 18. Habitat of *Anolis pecuarius* at Port Morgan, Île-à-Vache (18.10516, -73.6929, 15 m), Département du Sud, Haiti. Photo by Joel C. Timyan on 24 July 2011.

Anolis chlorodius sp. nov.

Figs. 18–22

Anolis coelestinus: Cochran, 1941 (in part.); Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Ramos & Powell, 2001b (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 97853, an adult male from La Manigua (18.19045, -71.77075), 570 m, Province Pedernales, Dominican Republic; collected 29 October 2013 by Gunther Köhler and Eladio Fernández. Field tag number GK-4778.

Paratypes. All from Province Pedernales, Dominican Republic: GK-4777, SMF 97852, 97854–55, same collecting data as holotype. SMF 99001, Pedernales, Hotel Doña Chava (18.03608, -71.74239), 20 m, collected 27 October 2013 by Gunther Köhler and Eladio Fernández. SMF 99002, Pedernales (18.03002, -71.74347), 10 m, collected 27 October 2013 by Gunther Köhler and Eladio Fernández. SMF 97856–57, Pedernales (18.03002, -71.74347), 10 m, collected 29 October 2013 by Gunther Köhler and Eladio Fernández. GK-4769, 4774, SMF 97848–51, 99000, Altigracia, north of Pedernales (18.18921, -71.72642), 760 m, collected 27 October 2013 by Gunther Köhler and Eladio Fernández. USNM 329046 (KJ566804, KJ566882) USNM 329047 (KJ566805, KJ566883), 14.5 km S Los Arroyos (18.14806, -71.74806), 760 m, collected 12 August 1983 by S. Blair Hedges and Richard Thomas. SMF 98136–37, USNM 558714 (KJ566845), USNM 558715, 18.2 km N Pedernales at stream (Los Arroyos border road) (18.15392, -71.74745), 200 m, collected 21 August 2005 by S. Blair Hedges, M. Heinicke, and N. Corona. KU 253043–44, Pedernales, collected 24 June 1964 by Richard Thomas. KU 253053–54, 17 km N Pedernales, collected 29 June 1964 by D. C. Leber. MCZ R-143382, 25 km N Cabo Rojo on Alcoa Mine road (18.09780, -71.64280), 900 m, collected 7 July 1974 by Paul E. Hertz and Raymond B. Huey.

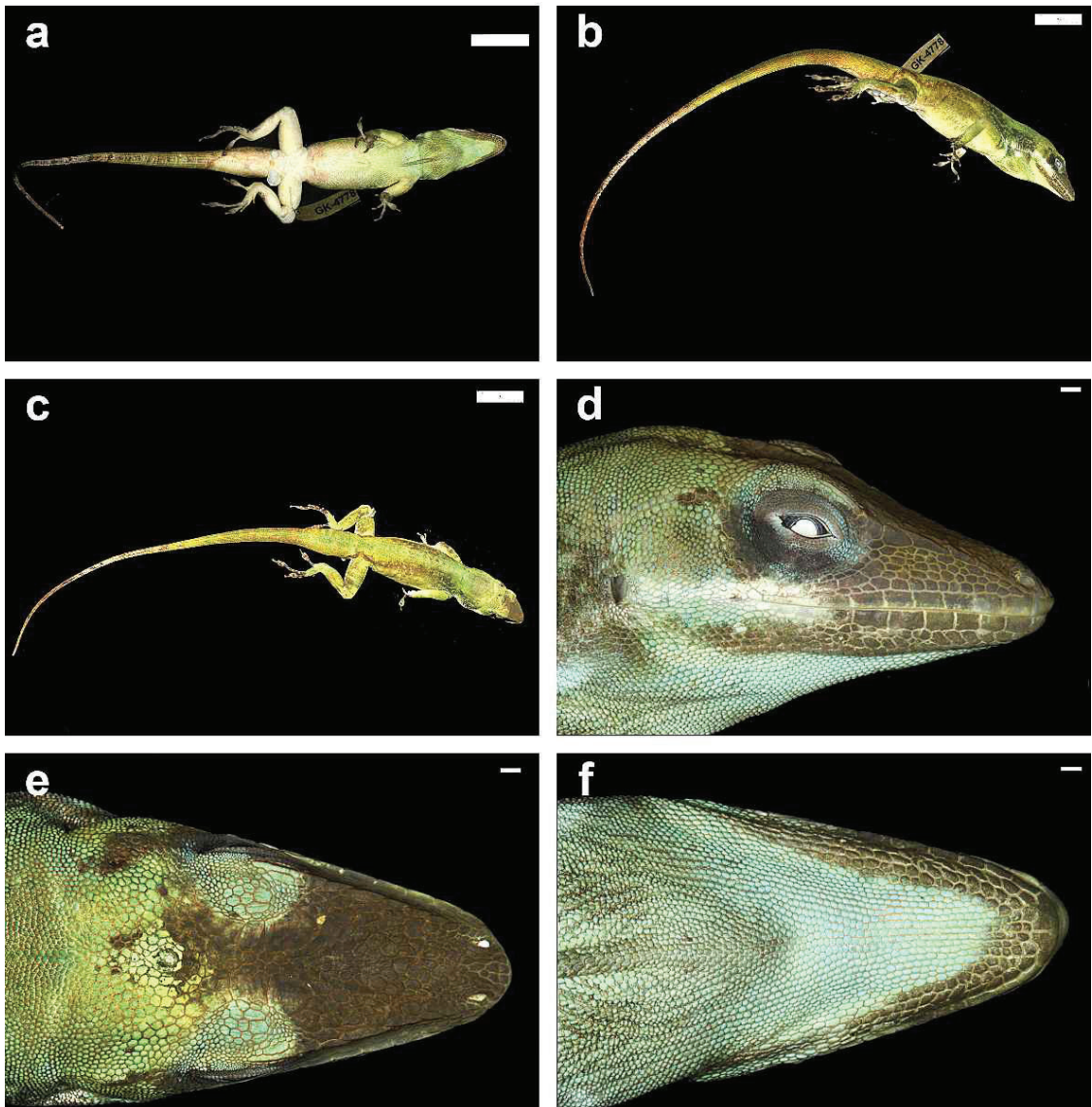


Figure 19. Holotype of *Anolis chlorodius* sp. nov. (SMF 97853). (a) dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

Referred specimens. Dominican Republic. Pedernales: 11 km SW Los Arroyos: KU 253051; 30 km N Pedernales: KU 216090; L'Eglise, 21 km N Cabo Rojo: KU 253062, 253125; Oviedo Nuevo: KU 253070. Haiti. Ouest: La Mahot on Sal Trou road: AMNH 49993; Sud'Est: 10.3 mi N Jacmel: KU 252953–54; 2 mi W Marigot: KU 252657–58; 3 mi E Cayes de Jacmel: KU 252649–50; 3 mi E Jacmel: KU 252656; 9.1 mi SW Seguin: KU 252724–25; 9.7 mi SW Seguin: KU 252932; Jacmel: KU 252661–62; Jacmel, grounds of Hotel Jacmelian: 0 m: USNM 558716 (KJ566824, KJ566890); Morne D'Enfer: SMF 98168; Terre Noire, 12 mi SW Jacmel: KU 252927–28.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. coelestinus*, *A. demissus*, and *A. pecuarius* and a species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) a white subocular stripe that continues as a white streak onto lateral neck (3) hind legs relatively short (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) ventral scales at midbody usually perfectly smooth; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species occurring treated in this contribution, *A. chlorodius* is most similar to *A. coelestinus*, *A. demissus*, *A. pecuarius*, and a species described below. *Anolis chlorodius* differs from *A. coelestinus* and *A. pecuarius* by having usually perfectly smooth, rarely faintly keeled ventral scales at midbody (vs. usually distinctly keeled). *Anolis chlorodius* differs from *A. demissus* and *A. pecuarius* by (1) usually having a white subocular stripe and a white streak on lateral neck and shoulder (vs. such a pattern usually not present in *A. demissus* and *A. pecuarius*); a bluish green to yellowish green male dewlap in life (vs. yellowish brown, dark gray, or greenish gray in *A. demissus* and *A. pecuarius*); and (3) by usually having a pattern of white to pale green vertical bars or blotches on flanks (vs. usually lacking any pattern on flanks in *A. demissus* and *A. pecuarius*). *Anolis chlorodius* differs from *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* by having (1) a yellowish green or brown (after metachrosis) in life dewlap with longitudinal or oblique double rows of gorgetal scales (vs. dewlap bicolored with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales); (2) and a blue iris in life (vs. brown to reddish brown). *Anolis chlorodius* differs further from *A. cyanostictus* (1) by having a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak in *A. cyanostictus*) and (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis chlorodius* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. chlorodius* and the species described below, see the respective accounts of the new species.

Description of the holotype. Adult male, as indicated by everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 74.0 mm; tail length 149.0 mm (tip missing); tail slightly depressed in cross section, tail height 5.1 mm and width 5.6 mm; axilla to groin distance 29.8 mm; head length 21.7 mm, head length/SVL ratio 0.29; snout length 11.1 mm; head width 12.0 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 16.5 mm, shank length/head length ratio 0.76; longest finger of extended forelimb reaching to nostril; longest finger of adpressed forelimb reaching to a point 3.7 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 8 postrostrals; 7 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 2 scale rows at narrowest point; supraorbital disc composed of 6 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a deep parietal depression present; interparietal scale well developed, 1.8 x 1.3 mm (length x width), surrounded

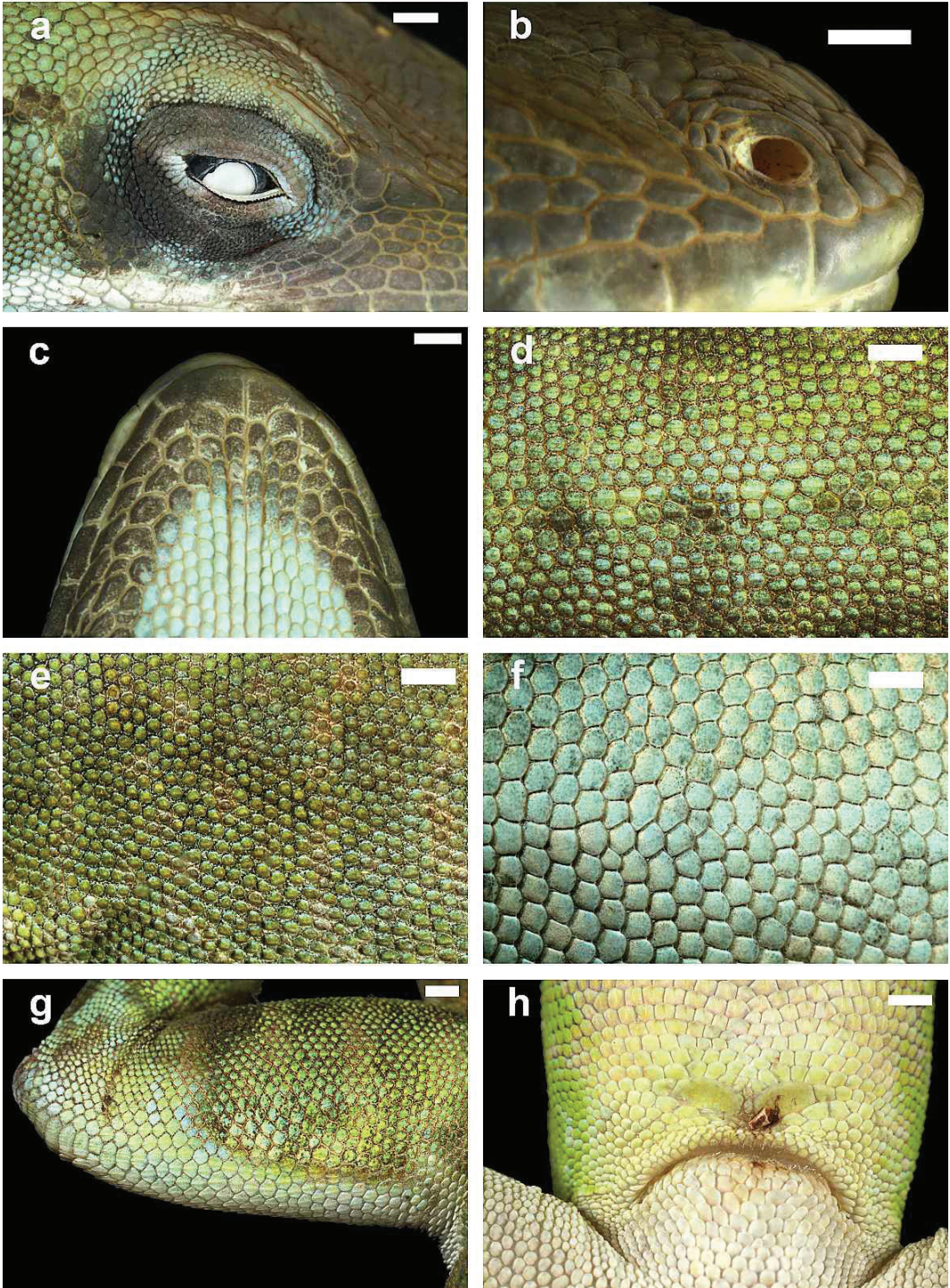


Figure 20. Holotype of *Anolis chlorodius* sp. nov. (SMF 97853). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

by scales of moderate size; 4 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 large and 4 to 6 small anterior canthal scales; 12 scales present between second canthals; 12 scales present between posterior canthals; 44 (right)–44 (left) mostly keeled loreal scales in a maximum of 6 (right)–6 (left) horizontal rows; 4 keeled subocular scales arranged in a single row; 8 supralabials to level below center of eye; 4 suboculars broadly in contact with 4 supralabials; ear opening 1.0 x 1.5 mm (length x height); mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 postmentals, outer ones slightly larger than median ones; 8 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small (170 mm²), extending from level below anterior margin of eye to level of axilla; 4–5 horizontal gorgetal–sternal double rows of irregular small scales among more regular larger gorgetals; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.50 x 0.40 mm (length x width); about 48 medial dorsal scales in one head length; about 87 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.30 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.60 x 0.65 mm (length x width); about 42 medial ventral scales in one head length; about 71 medial ventral scales between levels of axilla and groin; 140 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.5 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 44 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs.

The completely everted hemipenis (Fig. 21) is a slightly bilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; no asulcate ridge and no asulcate processus; a pronounced indentation on asulcate portion of apex; apex strongly calyculate, truncus and asulcate ridge with transverse folds.

The coloration in life was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Lime Green (116) with indistinct Parrot Green (121) vermiculations and a white streak from above shoulder onto lateral chest; circumorbital region Greenish Cyan (150); a white subocular stripe; dorsal surfaces of anterior two-thirds of tail Lime Green (116), distal portion Walnut Brown (27) with Sepia (279) bands; ventral surface of head Pale Green (99); ventral surface of body Light Greenish White (98); ventral surfaces of legs Drab (19) with suffusions of Clay Color (18); ventral surface of tail Pale Green (99); dewlap Pale Green (99) with Olive Yellow (117) streaks; iris Warm Sepia (40).

Coloration after six months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Vandyke Brown (281) except for Dark Pearl Gray (290) supraorbital and parietal regions, for a Paris White (139) subocular stripe, and Hair Brown (277) labial region; dorsal and lateral surfaces of neck, body, and limbs Glaucous (291) with a suggestion of Cyan Black (154); dorsal surfaces of fingers and toes Brownish Olive (292); dorsal and lateral surfaces of tail Medium Hooker's Green (137) grading distally into Grayish Horn Color (268) with Glaucous (291) bands; ventral surface of head Pale Cyan (157); dewlap Light Cyan (159) with a suggestion of Cyan Black (154); ventral surface of body Cream White (52) with a suggestion of Pale Cyan (157); ventral surfaces of limbs and base of tail Cream White (52); ventral surface of central portion of tail Citrine (119) with Cream White (52) and Burnt Umber (48) suffusions and indistinct bands; ventral surfaces of fingers and toes Glaucous (272).



Figure 21. Hemipenis of *Anolis chlorodius* sp. nov. (SMF 97853). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table I). The longest toe of adpressed hind leg reaching to slightly beyond ear opening or to a point between ear opening and eye in most individuals, occasionally ear opening. Dewlap size is 116 and 198 mm², respectively, in two males (SMF 97856, 99002), and 54 and 73 mm², respectively, in two females (GK-4769, SMF 97854).

The coloration in life of an adult male (SMF 97849) from Altigracia was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Lime Green (116) with indistinct Parrot Green (121) vermiculations and a white streak from above shoulder onto lateral chest; circumorbital region Greenish Cyan (150); a white subocular stripe; dorsal surfaces of anterior two-thirds of tail Lime Green (116), distal portion Walnut Brown (27) with Sepia (279) bands; ventral surface of head Pale Green (99); chest Light Greenish White (98); venter and base of tail Pale Greenish White (97); ventral surfaces of legs Pale Greenish White (97) suffused with Drab-Gray (256); ventral surface of tail Pale Green (99); dewlap Pale Green (99) with Olive Yellow (117) streaks; iris Warm Sepia (40).

Etymology. The name *chlorodius* is a noun in apposition derived from *chloros* (Greek for “green”).

Geographic distribution. As currently known, *Anolis chlorodius* is restricted to the southwestern portion of the Sierra de Bahoruco, Barahona Peninsula (Dominican Republic), and the southern portion of the Massif de la Selle (Haiti) from near seal level to about 900 masl (Fig. 10).

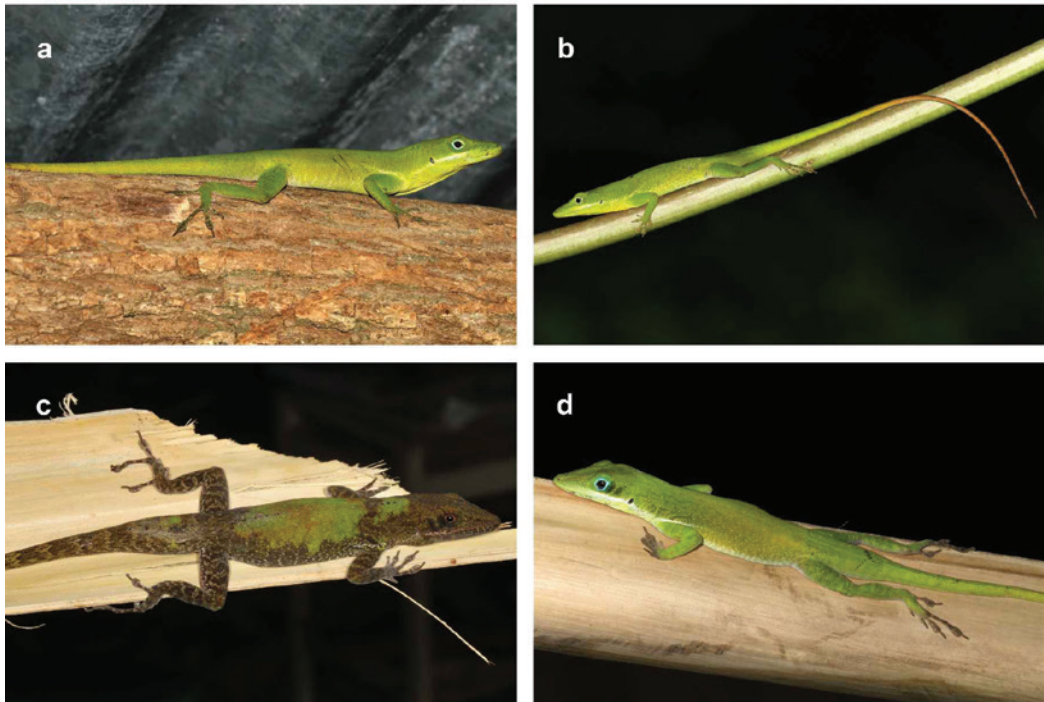


Figure 22. *Anolis chlorodius* sp. nov. in life (all males). (a) SMF 97852; (b) a specimen from La Aguita, Pedernales Province, Dominican Republic (not collected); (c) SMF 97849; (d) SMF 99002. Photos by G.K.

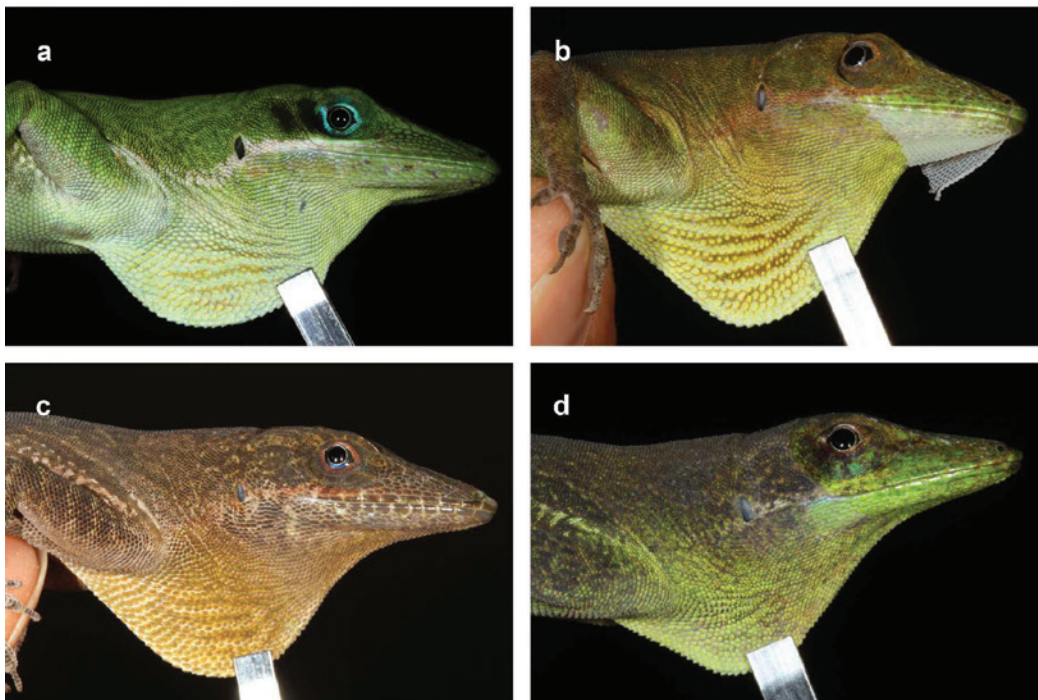


Figure 23. Dewlaps of *Anolis chlorodius* sp. nov. in life. (a) SMF 99002; (b) SMF 97852; (c) GK-4777; (d) GK-4769. (a-c) are males, (d) is a female. Photos by G.K.

Natural history notes. *Anolis chlorodius* is a common lizard where it occurs, mostly in disturbed habitat, along forest edges, and in villages (see also Fig. 24). The holotype was collected from the outside wall of a wooden house during daytime along with the topoparatypes. At night this lizards sleeps on leaves and twigs 2 to 4 m above the ground. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis coelestinus*” which under our concept is represented by three species (i.e., *A. coelestinus*, *A. chlorodius*, and a species described below).

Conservation. Given its broad distribution and local abundance, we consider the conservation status of *Anolis chlorodius* to be Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).



Figure 24. Habitat of *Anolis chlorodius* sp. nov. in riparian forest at Río Mulito (18.1571, -71.7580, 299 m), Pedernales Province, Dominican Republic. Photo by S.B.H. on 23 March 2004.



Figure 25. Comparison of ventral coloration in eight preserved specimens each of *Anolis viridius* sp. nov. (left) and *A. chlorodius* sp. nov. (right). Photo by S.B.H.



Figure 26. Comparison of ventral tail coloration in two preserved specimens each of *Anolis viridius* sp. nov. (left) and *A. chlorodius* sp. nov. (right). Photo by S.B.H.

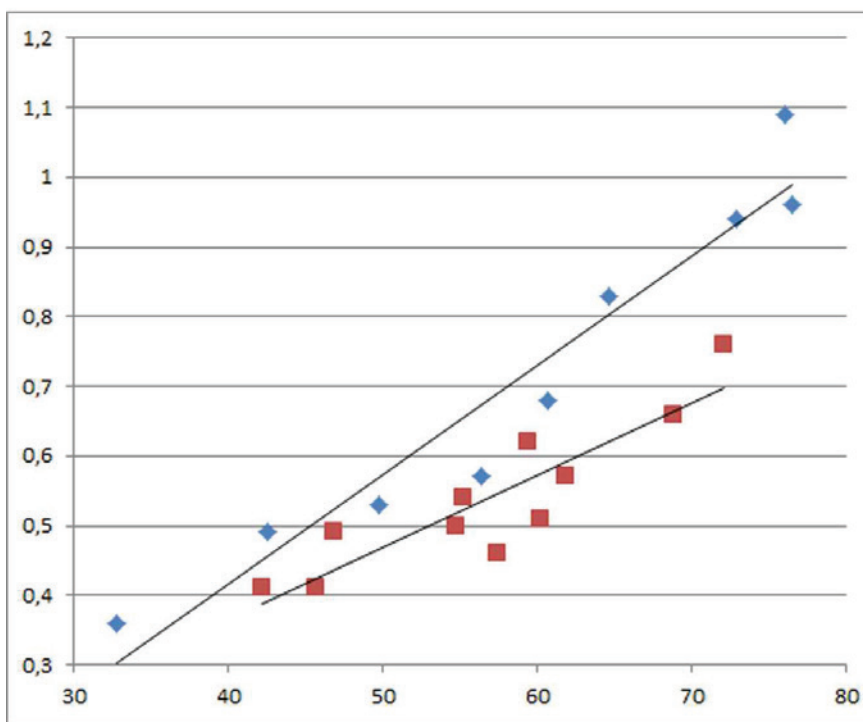


Figure 27. Graph with values of supralabial height (average height of the first two supralabial scales) plotted against SVL in *Anolis viridius* sp. nov. (red symbols) and *A. chlorodius* sp. nov. (blue symbols).

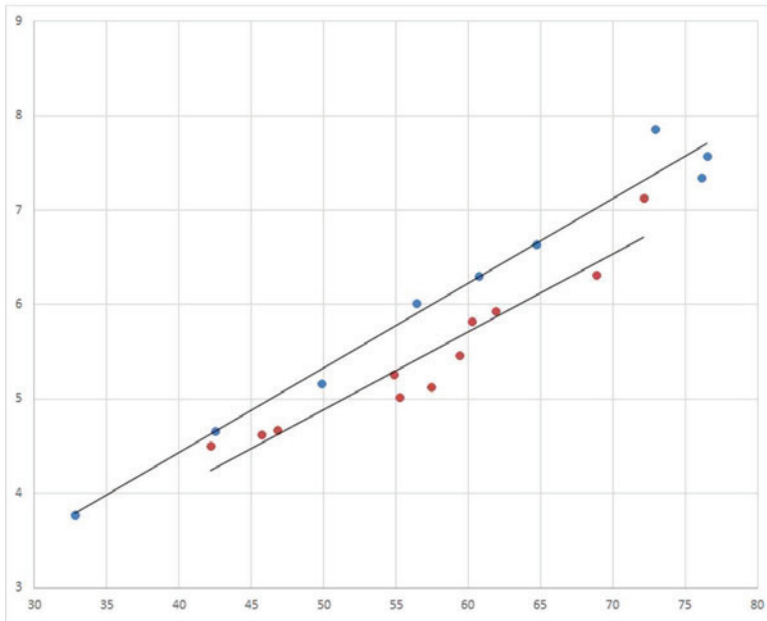


Figure 28. Graph with values of canthal width (measured at the midpoint of the eye center-to-narial distance, across the snout from canthal ridge to canthal ridge) plotted against SVL in *Anolis viridius* sp. nov. (red symbols) and *A. chlorodius* sp. nov. (blue symbols).

Anolis viridius sp. nov.

Figs. 29–32

Anolis coelestinus: Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); García *et al.*, 1994; Powell *et al.*, 1996 (in part.); Ramos & Powell, 2001b (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 98011, an adult male from Monteada Nueva (18.12108, -71.25484), 1210 m, Province Barahona, Dominican Republic; collected 2 November 2013 by Gunther Köhler and Marcos Rodríguez. Field tag number GK-4864.

Paratypes. All from Province Barahona, Dominican Republic: SMF 98000–04, Los Lirios (18.10834, -71.265050), 1030 m, collected 29 October 2013 by Gunther Köhler and Marcos Rodríguez. SMF 98005, entrance of road to Cortico (18.13273, -71.26696), 1060 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. SMF 98006–07, near Polo (18.11350, -71.26964), 855 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. GK-4845, SMF 98008–10, near Cortico, Laguna (18.11163, -71.22293), 1340 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. AMNH 41321, Barahona, collected 15 October 1922 by Gladwyn K. Noble. KU 253038–39, Barahona, collected 24 July 1963 by local collectors. USNM 329049 (KJ566808, EF531472), USNM 329050 (KJ566809), Oviedo Polo (17.78833, -71.39694), collected 21 August 1984 by local collectors. SMF 98189 (KJ566834), USNM 558739, 5 km SW Los Tres Charcos, ca. 0.5 km NW Fondo de Paradise Polo (17.79667, -71.46667), 85 m, collected 1 January 1998 by S. Blair Hedges, Michael Tracy, Renee Sharp, Jenny Cutraro, and Richard Thomas. KU 316261–62, Monteada Nueva, 1210 m, collected 5 March 1990 by Avila Field Biology. MCZ R-143377, Polo, 690 m, collected 11 July 1974 by Paul E. Hertz and Raymond B. Huey.

Referred specimens. Dominican Republic. Barahona: 0.9 mi NW Arroyo Dulce: KU 253123; 1 km E Monteadá Nueva, 12 km S Cabral Polo road: KU 316166; 1.4 mi NE Enriquillo: KU 253058; 1.5 mi SE Arroyo Dulce: KU 253124; 10 km W La Ciénega: KU 316177–79; 13 mi SE Cabral: KU 253130–31; 14 km SW Barahona: KU 253087–88; 14–15 km SE Polo on Polo–Paraíso road, at village of La Lancia: MCZ R-160545, 160547; 14.6 km W Barahona, on La Guazara (Green Chapel) road (2.9 km W La Guazara): USNM 259373–76; 15 km S of Barahona: MCZ R-143384; 16 km S Cabral: KU 253065–66; 2 km E Monteadá Nueva, 12 km S Cabral Polo Rd: KU 316196; 2 km NW Paraíso: KU 253098–99; 2.4 km WNW Paraíso, 200 m: USNM 329043, USNM 329044 (KJ566803, KJ566881); 2.9 miles NW La Ciénega, 353 m: SMF 98190 (KJ566835); 20.8 km S Cabral: USNM 329045 (KJ566806), SBH 102686 (KJ566807, KJ566884); 21 km S Cabral, road to La Lanza: KU 253072; 3.3 mi NE La Ciénega: KU 253026–27; 4 km SE Polo: KU 253056; 4.8 mi W Paraíso: KU 253165–66; 6 km inland from Paraíso: KU 316210–11; 6 km NE Las Auyamas: KU 253045–46; 7 km SW Barahona: KU 253084–85; Barahona: SMF 26149–52; ca. 6–7 km W Paraíso, 180 m: USNM 329041–42; Cabral, woods just S of town: AMNH 51565; Coconut Grove, just SW of town: AMNH 51545, 51547; Del Monte’s Finca, El Propio Esfuerzo, on mountain near Barahona, 545 m: AMNH 51595; Enriquillo, on coast 30 miles S Barahona: AMNH 51741; Herrmann’s Finca, near Paraíso: AMNH 51654; junction of Paraíso road with road from Cabral to Polo: MCZ R-160529; La Cueva, 11 km S Central: MCZ R-57520; Las Auyamas: KU 253144–45; Las Ciénegas road, 5.4 km inland from highway 44: KU 316235–36; Loma Remigio: KU 325187–88; Los Patos: KU 253063; Monteadá Nueva, 1210 m: KU 316261–62; Monteadá Nueva, 1210 m: KU 316262; Playa de Saladilla: MCZ R-79381; Sta. Elena road 6 km inland from highway 44: KU 316263–64, 316279; Valle de Polo: AMNH 51205, 51207, 51657, 51659, 51707, 51709, 51711; vicinity of Barahona: USNM 329040; Pedernales: 1 km NE Juancho: MCZ R-150384.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. coelestinus*, *A. chlorodius*, *A. demissus*, and *A. pecuarius* by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) a white subocular stripe that continues as a white streak onto lateral neck (3) hind legs relatively short (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) ventral scales at midbody usually perfectly smooth; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal or oblique double rows of gorgetal scales; (7) ratio tail length / SVL >1.7, usually >2.0.

Among the *Anolis* species occurring treated in this contribution, *A. viridius* is most similar to *A. coelestinus*, *A. chlorodius*, *A. demissus*, and *A. pecuarius*. *Anolis viridius* differs from *A. coelestinus* and *A. pecuarius* by having usually perfectly smooth, rarely faintly keeled ventral scales at midbody (vs. usually distinctly keeled). *Anolis viridius* differs from *A. demissus* and *A. pecuarius* by (1) usually having a white subocular stripe and a white streak on lateral neck and shoulder (vs. such a pattern usually not present in *A. demissus* and *A. pecuarius*); a bluish green to yellowish green male dewlap in life (vs. yellowish brown, dark gray, or greenish gray in *A. demissus* and *A. pecuarius*); and (3) by usually having a pattern of white to pale green vertical bars or blotches on flanks (vs. usually lacking any pattern on flanks in *A. demissus* and *A. pecuarius*). *Anolis viridius* differs from *A. chlorodius* by having an overall darker body coloration (Fig. 25), especially evident in the temporal region where the former species has blackish skin between the scales (vs. pale gray or dirty white skin in *A. chlorodius*). Also, the tail in *A. viridius* is dark and without distinctive pattern whereas that of *A. chlorodius* is pale with distinctive spots and bands (Fig. 26). Furthermore, *A. viridius* has lower supralabials and infralabials than *A. chlorodius* (ratio height of first supralabial / SVL >0.011 in *A. viridius* vs. <0.011 in *A. chlorodius*; Fig. 27), and the head bulges out less in *A. viridius* than in *A. chlorodius*

(ratio intercanthal width at midpoint of eye center-to-narial distance / SVL >0.10 in *A. viridius* vs. <0.10 in *A. chlorodius*; Fig. 28). And it is noticeable that *A. viridius* has a more depressed snout than *A. chlorodius*. Finally, the two species differ in the total number of loreals scales (26–43, mean 35.1, in *A. viridius* vs. 31–60, mean 39.7, in *A. chlorodius*). *Anolis viridius* differs from *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* by having (1) a yellowish green or brown (after metachrosis) in life dewlap with longitudinal or oblique double rows of gorgetal scales (vs. dewlap bicolored with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales); (2) and a blue iris in life (vs. brown to reddish brown). *Anolis viridius* differs further from *A. cyanostictus* (1) by having a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak in *A. cyanostictus*) and (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis viridius* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7 , usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. viridius* and the species described below, see the respective accounts of the new species.

Description of the holotype. Adult male, as indicated by everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 83.0 mm; tail length 152.0 mm (tip missing); tail slightly depressed in cross section, tail height 5.8 mm and width 6.0 mm; axilla to groin distance 32.8 mm; head length 24.3 mm, head length/SVL ratio 0.29; snout length 12.6 mm; head width 13.1 mm; longest toe of adpressed hind limb reaching to almost ear opening; shank length 17.6 mm, shank length/head length ratio 0.72; longest finger of extended forelimb reaching to a point 4.9 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 2.6 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region keeled, uncarinate; other dorsal head scales smooth, rugose, or keeled; 6 postrostrals; 8 scales between nasals; 1 elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 3 scale rows at narrowest point; supraorbital disc composed of 6 to 8 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 2 rows of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated, strongly overlapping superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate parietal depression present; interparietal scale well developed, 1.9 x 1.1 mm (length x width), surrounded by scales of moderate size; 4 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 large and 3 to 5 small anterior canthal scales; 12 scales present between second canthals; 14 scales present between posterior canthals; 39 (right)–42 (left) mostly keeled loreal scales in a maximum of 6 (right)–5 (left) horizontal rows; 4 keeled subocular scales arranged in a single row; 8 supralabials to level below center of eye; 4 suboculars broadly in contact with 5 supralabials; ear opening 0.9 x 2.0 mm (length x height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 6 postmentals, outer ones slightly larger than median ones; 8 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small (205 mm²), extending from level below anterior margin of eye to level of axilla; 4–5 horizontal gorgetal–sternal double rows of irregular small scales among more regular larger gorgetals; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.62 x 0.45 mm (length x width); about 50 medial dorsal scales in one head length; about 81 medial dorsal scales between levels

of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.35 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.70 x 0.60 mm (length x width); about 39 medial ventral scales in one head length; about 59 medial ventral scales between levels of axilla and groin; 136 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 2.1 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 4 to 5 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 45 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs.

The completely everted hemipenis (Fig. 27) is a slightly bilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; no asulcate ridge and no asulcate processus; a pronounced indentation on asulcate portion of apex; apex strongly calyculate, truncus and asulcate ridge with transverse folds.

The coloration in life was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Lime Green (116) with a Paris White (139) streak from above shoulder onto lateral chest; circumorbital region Light Emerald Green (142); flanks with Olive–Yellow (117) and Light Lime Green (113) splotches; a Paris White (139) subocular stripe; dorsal surface of tail Lime Green (116) grading into Walnut Brown (27) distally; ventral surface of head Yellow–Green (103); ventral surface of body Light Lime Green (113); ventral surfaces of legs Cinnamon–Drab (50); ventral surface of anterior portion of tail Yellow–Green (103), grading into Olive–Brown (278) on distal portion and into Drab (19) on tip; dewlap Chartreuse (89) with a suffusion of Olive Sulphur (90) anteriorly and with Olive Clay Color (85) skin between gorgetals; iris Dark Grayish Brown (284) with Smalt Blue (185) upper area.

Coloration after six months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Vandyke Brown (281) except for Dark Pearl Gray (290) supraorbital and parietal regions, for a Paris White (139) subocular stripe, and Hair Brown (277) labial region; dorsal surfaces of neck and body Dark Egg Blue (162); lateral surfaces of neck and body Hooker’s Green (138) with Cinnamon–Drab (50) splotches; dorsal and lateral surfaces of limbs and tail Medium Hooker’s Green (137) with Grayish Horn Color (268) bands; dorsal surfaces of fingers and toes Brownish Olive (292); ventral surface of head Light Smoke Gray (263) anteriorly and Light Cyan (159) posteriorly; dewlap Light Cyan (159) with a suffusion of Cyan Black (154); ventral surface of body Pale Cyan (157) with a suffusion of Salmon Color (58) on posterior portion; ventral surfaces of limbs and base of tail Cream White (52); ventral surface of central portion of tail Smoke Gray (266) with Grayish Olive (273) suffusions, distal portion Dusky Brown (285); ventral surfaces of fingers and toes Grayish Horn Color (268).

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table 1). The longest toe of adpressed hind leg reaching to ear opening in most individuals, occasionally to a point between shoulder and ear opening or slightly beyond ear opening. Dewlap size is 121 mm² in another male (SMF 98003), and 29 and 63 mm², respectively, in two females (SMF 98000, 98004).

Etymology. The name *viridius* is a noun in apposition derived from *viridis* (Latin for “green”).

Geographic distribution. As currently known, *Anolis viridius* is restricted to the eastern portion of the Sierra de Bahoruco, Dominican Republic, from near sea level to about 1340 masl (Fig. 10).

Natural history notes. *Anolis viridius* is a common lizard where it occurs, mostly in disturbed habitat, along forest edges (Fig. 30), and in villages. The holotype was collected from the outside wall of a concrete house near its zink ceiling during daytime. At night this lizards sleeps on leafs and twigs 2 to 4 m above the ground. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis coelestinus*” which under our concept is represented by three species (i.e., *A. coelestinus*, *A. chlorodius*, and *A. viridius*).

Conservation. Given its usual abundance wherever this species occurs along with its relatively large geographical range, we consider the conservation status of *Anolis viridius* to be Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).

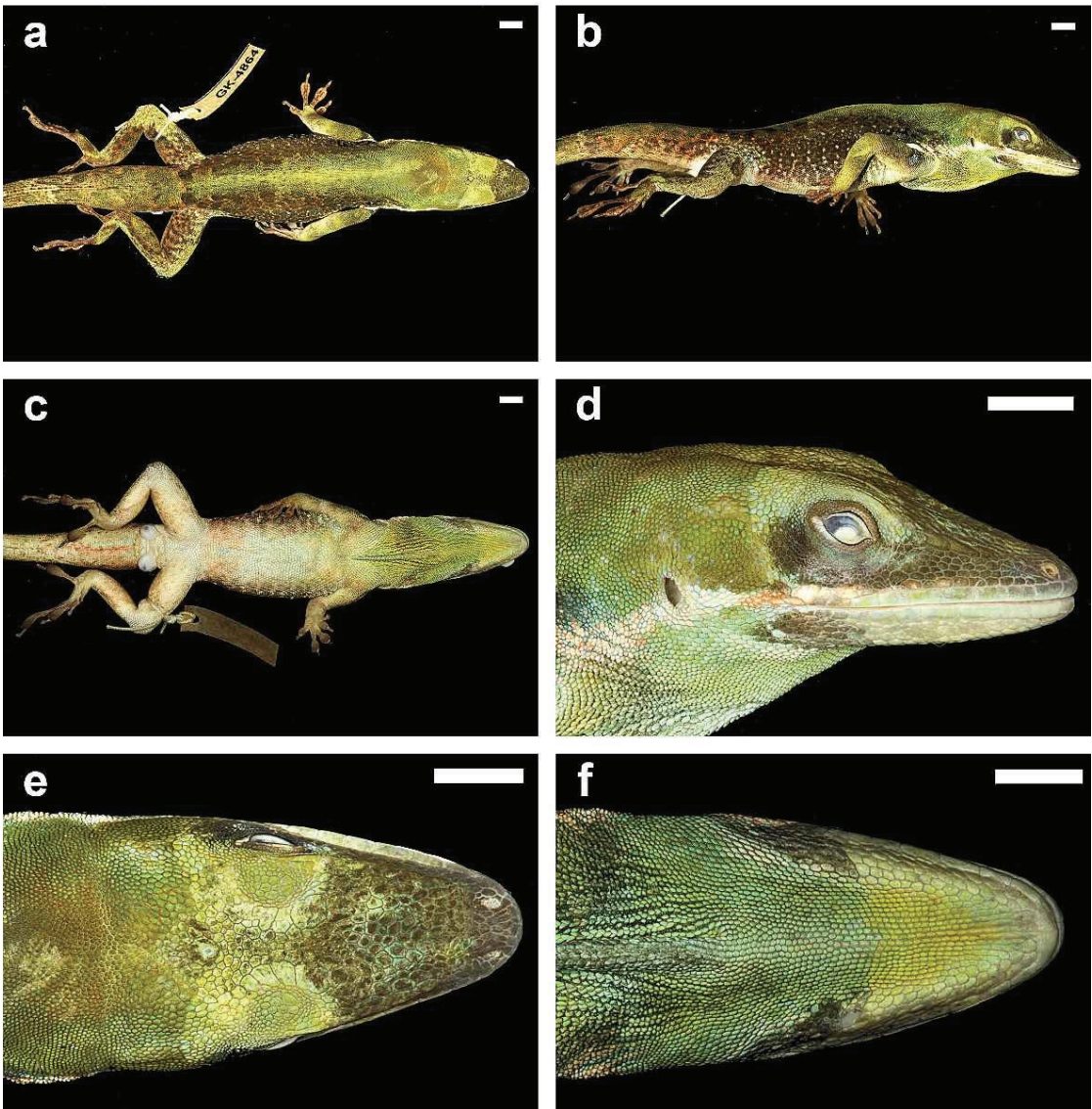


Figure 29. Holotype of *Anolis viridius* sp. nov. (SMF 98011). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

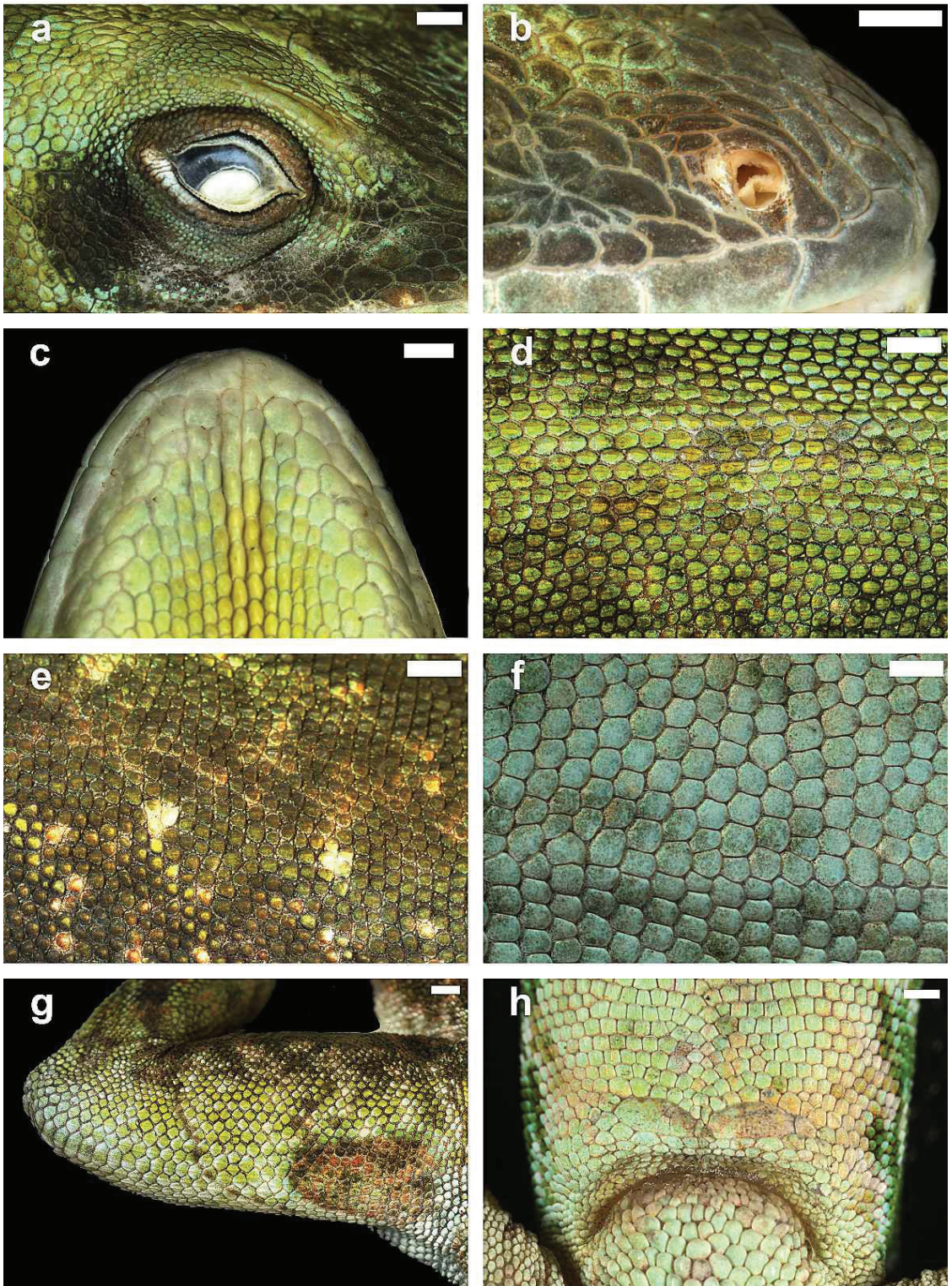


Figure 30. Holotype of *Anolis viridius* sp. nov. (SMF 98011). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

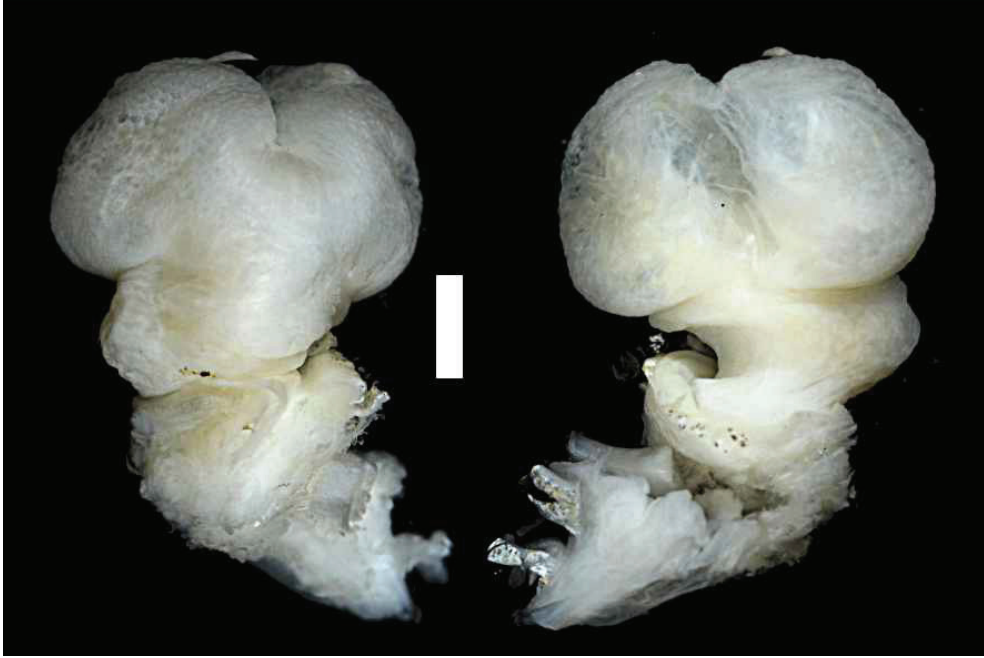


Figure 31. Hemipenis of *Anolis viridius* sp. nov. (SMF 98011). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

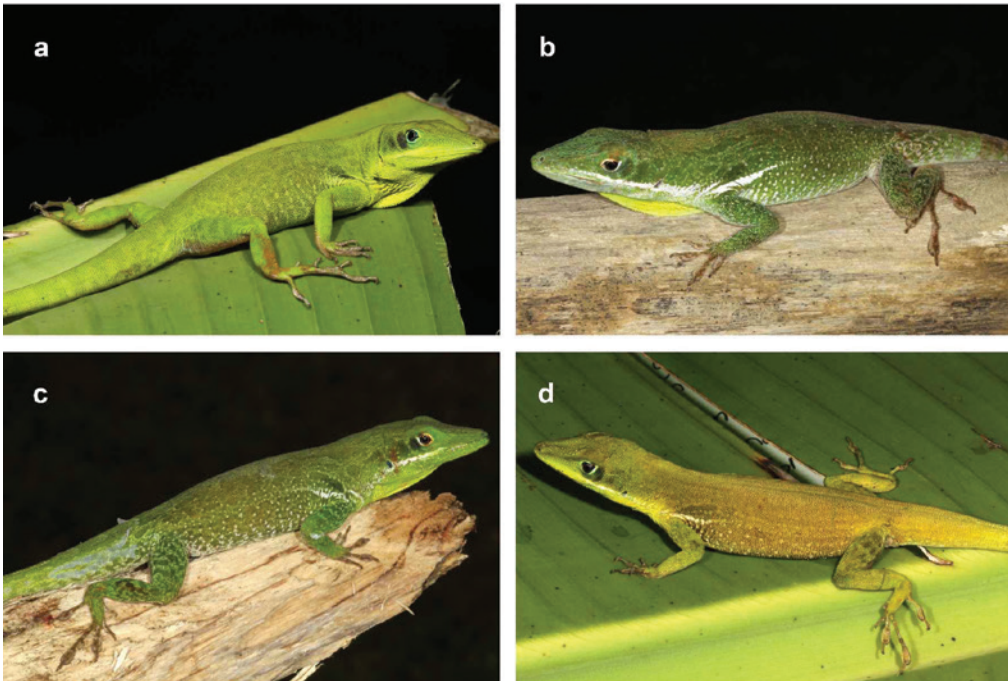


Figure 32. *Anolis viridius* sp. nov. in life. (a) SMF 98004; (b) SMF 98011; (c) SMF 98010; (d) SMF 98000. (a–c) are males, (d) is a female. Photos by G.K.

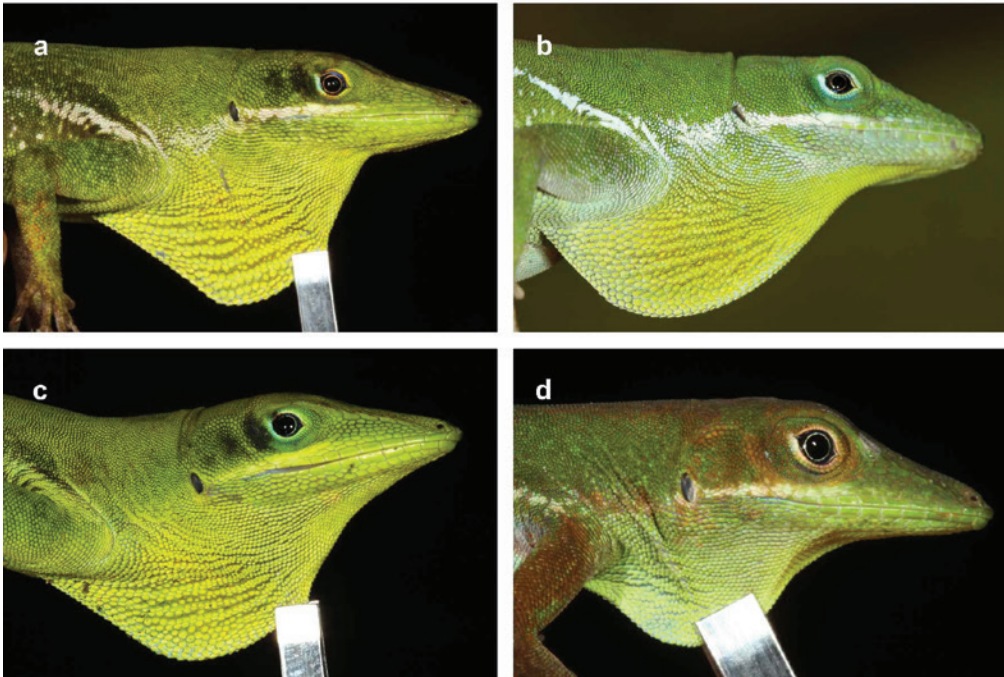


Figure 33. Dewlaps of *Anolis viridius* sp. nov. in life. (a) SMF 98003; (b) SMF 98011; (c) SMF 98004; (d) SMF 98005. (a–c) are males, (d) is a female. Photos by G.K.



Figure 34. Habitat of *Anolis viridius* sp. nov. near Polo (18.11350 -71.26964, 855 m), Barahona Province, Dominican Republic. Photo by G.K. on 31 October 2013.

TAXONOMY OF THE ANOLES IN THE *ANOLIS CHLOROCCYANUS* SPECIES GROUP

The anoles in the *Anolis chlorocyanus* species group are readily differentiated from all other Hispaniolan congeners by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) white subocular stripe and white streak onto lateral neck present or absent (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth to faintly keeled or groups of keeled scales among otherwise smooth ventrals; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap bluish green or brown (after metachrosis) in life with a suffusion of black pigment on posterior portion, gorgetals large and irregularly arranged, especially on posterior portion of dewlap; (7) ratio tail length / SVL >1.7, usually >2.0.

Based on the observed morphological differentiation (mostly in color pattern of head, body, and male dewlap; see the respective Diagnosis sections) and a high level of genetic differentiation among the genetic clusters (Fig. 6), we recognize four species level units in the *Anolis chlorocyanus* species group: Species A (populations east and north of the central mountains, Dominican Republic); Species B (specimens from the metropolitan area of Santo Domingo as well as regions somewhat to north and to the west of the capital, Dominican Republic); Species C (region of Barahona, Dominican Republic, west along the Valle de Neiba and Cul de Sac in Haiti to Port-au-Prince, and north throughout western Dominican Republic and northern Haiti, excluding the northwestern portion around Môle San Nicolas); and Species D (northwestern peninsula of Haiti, from Bombardopolis to coast north of Môle San Nicolas). In scalation, these four species are more conservative and not easily differentiated (Table I).

Three names are available for the species in the *Anolis chlorocyanus* species group: *Anolis chlorocyanus* Duméril & Bibron 1837, *Anolis chlorocyanus cyanostictus* Mertens 1939 and *Anolis chlorocyanus peynadoi* Mertens 1939. Because of the neotype designation of *Anolis chlorocyanus* Duméril & Bibron 1837, we apply this name to our Species A (populations east and north of the central mountains, Dominican Republic). Based on the respective type localities and our morphological data, we apply the name *cyanostictus* to our Species B (*Anolis cyanostictus*) and apply the name *peynadoi* to our Species C (*Anolis peynadoi*). No names are available for our Species D, and therefore we describe it as a new species below.

TAXONOMÍA DE LOS *ANOLIS* EN EL GRUPO DE ESPECIES *ANOLIS CHLOROCCYANUS*

Los *Anolis* en el grupo de especies *Anolis chlorocyanus* se distinguen fácilmente de todos los demás congéneres de la Hispaniola por la combinación de tener (1) coloración general en vida predominantemente verde (capaces de cambio rápido de color a marrón); (2) con raya subocular y raya blanca extendiéndose en la parte lateral del cuello presente o ausente; (3) patas posteriores relativamente cortas (cuarto dedo de la pata posterior extendido a lo largo del cuerpo alcanzando hasta la abertura del oído o solo ligeramente mas allá de la abertura del oído); (4) las escamas ventrales a medio cuerpo lisas o débilmente aquilladas o con grupos de escamas aquilladas entre escamas lisas; (5) 39 – 47 lamelas subdigitales en las Falanges II – IV del IV dedo de las patas posteriores; (6) saco gular en vida de los machos verde azulado o marrón (después de la metacrosis) con una difusión de pigmente negro sobre la porción posterior, gorgetales grandes dispuestas irregularmente, especialmente sobre la porción posterior del saco gular; (7) proporción longitud de la cola/LHC >1.7, frecuentemente >2.0.

En base a las diferencias morfológicas observadas (mayormente en patrones de coloración de la cabeza, cuerpo, y saco gular de los machos; ver las respectivas secciones de Diagnósis) y

un alto nivel de diferenciación genética entre los agrupamientos genéticos (Fig. 6), reconocemos unidades al nivel de especies en el grupo de especies de *Anolis chlorocyanus*: Especie A (poblaciones al este y norte de las montañas centrales, República Dominicana); Especie B (especímenes del área metropolitana de Santo Domingo, así como de regiones algo al norte y oeste de la capital, República Dominicana; Especie C (región de Barahona, República Dominicana, hacia el oeste a lo largo del Valle de Neiba y del Cul de Sac en Haití, hasta Puerto Príncipe, y hacia el norte a través del occidente de República Dominicana y el norte de Haití, excluyendo la porción noroccidental alrededor de Môle San Nicolas); y Especie D (Península Noroeste de Haití, desde Bombardopolis hasta la costa norte de Môle San Nicolas). En escamación, estas cuatro especies son más conservadoras y no son fácilmente diferenciables (Tabla I).

Hay tres nombres disponibles para las especies en el grupo de especies *Anolis chlorocyanus*: *Anolis chlorocyanus* Duméril & Bibron 1837, *Anolis chlorocyanus cyanostictus* Mertens 1939 y *Anolis chlorocyanus peynadoi* Mertens 1939. Debido a la designación del neotipo de *Anolis chlorocyanus* Duméril & Bibron 1837, aplicamos este nombre a la Especie A (poblaciones al este y norte de las montañas centrales, República Dominicana). Basado en las localidades tipo respectivas y los datos morfológicos, aplicamos el nombre *cyanostictus* a nuestra Especie B (*Anolis cyanostictus*) y aplicamos el nombre *peynadoi* a nuestra Especie C (*Anolis peynadoi*). No hay nombre disponible para nuestra Especie D, y por lo tanto la describimos como especie nueva más abajo.

Anolis chlorocyanus Duméril & Bibron, 1837

Figs. 35–39

Anolis chloro-cyanus Duméril & Bibron, 1837: 117; type locality: “El Limón, Península Samaná (19.28929, -69.43118), 30 m, Province Samaná, Dominican Republic” by neotype selection. Neotype: SMF 97845 (see Köhler & Hedges, 2015).

Anolis chlorocyanus: Boulenger, 1885 (in part.); Garman, 1887; Barbour, 1914 (in part.); Schmidt, 1921; Williams, 1965 (in part.); Schwartz, 1980 (in part.); Powell *et al.*, 1996 (in part.).

Anolis chlorocyanus chlorocyanus: Schwartz & Thomas, 1975 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Ramos & Powell, 2001a (in part.); Henderson & Powell, 2009 (in part.).

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. peynadoi* by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (3) the ventral scales at midbody smooth; (4) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (5) male dewlap with large and irregularly arranged gorgetals, especially on posterior portion of dewlap; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species occurring treated in this contribution, *A. chlorocyanus* is most similar to *A. cyanostictus*, *A. peynadoi*, and a species described below (our Species D of this complex). *Anolis chlorocyanus* differs from *A. cyanostictus* by (1) having usually smooth ventral scales (vs. weakly keeled in *A. cyanostictus*); (2) by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*); (3) by having the posterior portion of the male dewlap intensively suffused with black pigment, and (4) adult females with longitudinal stripes on body (vs. uniformly colored in female *A. cyanostictus*). *Anolis chlorocyanus* differs from *A. peynadoi* in (1) having only a weak

suffusion of black pigment on the posterior portion of the male dewlap with less widely spaced gorgetal scales (vs. dewlap skin on posterior portion solid black with widely spaced gorgetal scales in *A. peynadoi*); (2) no white streak on upper lip (vs. a white streak usually present in *A. peynadoi*, most obvious in life); (3) a more slender habitus (vs. a more robust habitus in *A. peynadoi*); and (4) slightly to moderately enlarged outer postmental scales, less than three times the size of adjacent medial scales (vs. moderately to greatly enlarged outer postmental scales, about three times the size of adjacent medial scales in *A. peynadoi*). *Anolis chlorocyanus* differs from the species related to *A. coelestinus* by having (1) a bicolored dewlap with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales (vs. dewlap yellowish green or brown in life dewlap with longitudinal or oblique double rows of gorgetal scales); (2) 12–24 loreal scales in a maximum of 3–4 rows (vs. 18–48, usually >28 loreal scales in a maximum of 3–7 rows); (3) the absence of a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. such stripe and streak present or absent); and (4) a brown to reddish brown iris in life (vs. a blue iris). *Anolis chlorocyanus* differs from *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. chlorocyanus* and the species described below, see the respective account of the new species.

Description of the neotype (SMF 97845; Fig. 35 and 36). Adult male, as indicated by everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 68.0 mm; tail length 50.0 mm (incomplete); tail slightly depressed in cross section, tail height 4.4 mm and width 5.0 mm; axilla to groin distance 26.4 mm; head length 20.6 mm, head length/SVL ratio 0.30; snout length 10.7 mm; head width 10.9 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 14.6 mm, shank length/head length ratio 0.71; longest finger of extended forelimb reaching to a point 2.6 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 3.8 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region keeled, uni- to multicarinate; other dorsal head scales smooth, rugose, or keeled; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral and first supralabial; circumnasal in contact with first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 scale at narrowest point; supraorbital disc composed of 3 moderately enlarged, smooth to faintly keeled scales arranged in 2 to 3 rows; 1 complete row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate parietal depression present; interparietal scale well developed, 1.3 x 0.8 mm (length x width), surrounded by scales of moderate size; 3 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 5 large and 1 to 2 small anterior canthal scales; 7 scales present between second canthals; 8 scales present between posterior canthals; 17 (right)–16 (left) mostly keeled loreal scales in a maximum of 3 horizontal rows; 6 keeled subocular scales arranged in a single row; 7 supralabials to level below center of eye; 4 suboculars broadly in contact with 5 supralabials; ear opening 0.5 x 0.9 mm (length x height); mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 postmentals, outer ones about twice the size of median ones; 7 infralabials to level below center of eye; sublabials not differentiated; weakly keeled granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; gorgetal scales more or less arranged in rows, central and anterior gorgetal scales smaller and narrower spaced than those on posterior portion of dewlap; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly enlarged; largest

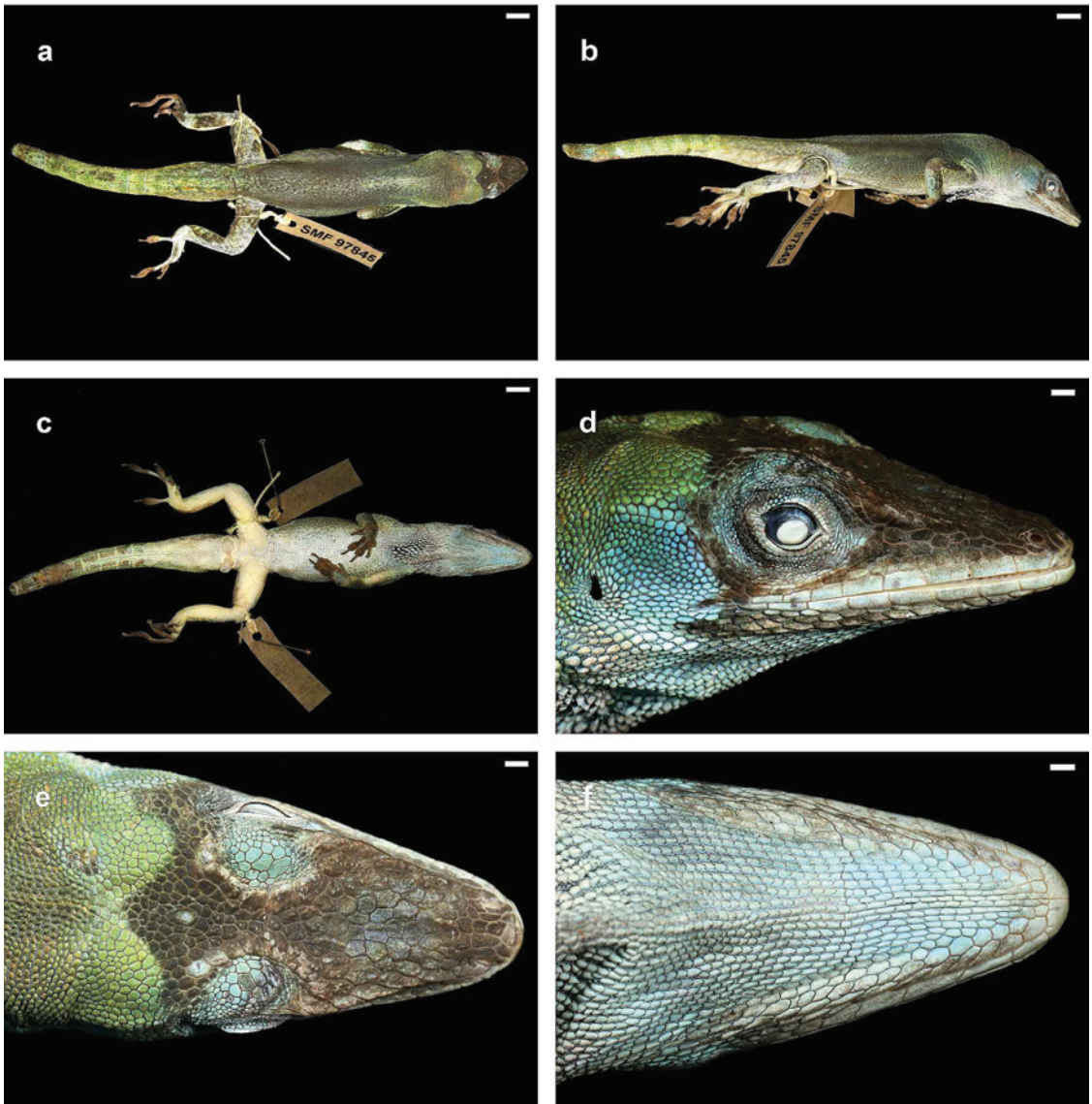


Figure 35. Neotype of *Anolis chlorocyanus* (SMF 97845). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

dorsal scales about 0.53 x 0.30 mm (length x width); about 41 medial dorsal scales in one head length; about 63 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.30 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.50 x 0.55 mm (length x width); about 38 medial ventral scales in one head length; about 61 medial ventral scales between levels of axilla and groin; 119 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest, 4 supracaudals per caudal segment; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.5 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long

as high; digital pads dilated, dilated pad 4 to 5 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 39 (right)–40 (left) lamellae under phalanges II–IV of Toe IV of hind limbs; 7 scales under distal phalanx of Toe IV of hind limbs.

The coloration in life was recorded as follows: Dorsal and lateral surfaces of head Light Paris Green (144), grading into Parrot Green (121); dorsal surface of body Parrot Green (121); dorsal surfaces of legs and tail Lime Green (105) with Parrot Green (121) bands; ventral surface of body Pale Green (99); ventral surfaces of legs Olive Yellow (117); ventral surfaces of feet Ground Cinnamon (270); subdigital lamellae Grayish Horn Color (268); ventral surface of tail Pale Lime Green (112) on basal portion and Medium Lime Green (114) on central and distal portions; dewlap Light Cyan (158) except for Cyan Black (154) posterior portion; iris Mikado Brown (42).

Coloration after three months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Sepia (279) except for Dark Greenish Cyan (152) supraorbital region; dorsal and lateral surfaces of neck Cyan Black (153) with a suffusion of Dusky Brown (285); dorsal and lateral surfaces of limbs and tail Light Bluish Gray (288) with suffusions of Dusky Brown (285); ventral surface of head Light Cyan (258); dewlap Jet Black (300) with Cyan White (156) gorgetals; ventral surface of body Cream White (52) with a suffusion of Light Sky Blue (191) on posterior portion; ventral surfaces of limbs and of base of tail Cream White (52); ventral surface of central portion of tail Cream White (52) with Dusky Brown (285) suffusions; ventral surfaces of fingers and toes Glaucous (289).

The longest toe of adpressed hind leg reaching to ear opening in most individuals, occasionally to slightly beyond ear opening or almost to ear opening. Dewlap size is 129, 138, 188, and 254 mm², respectively, in four males (GK-4719, SMF 97843, 97840, 97860), and 52 and 62 mm², respectively, in two females (GK-4686, SMF 97861).

The completely everted hemipenis (SMF 97844, Fig. 37) is a slightly bilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; no asulcate ridge and no asulcate processus; apex strongly calyculate, truncus and asulcate ridge with transverse folds.

The coloration in life of an adult male (SMF 97840) from El Seibo was recorded as follows: Dorsal surfaces of head, body, and limbs Lime Green (116); dorsal surfaces of fingers and toes Drab-Gray (256); circumorbital region suffused with Light Greenish Cyan (149); dorsal surface of anterior two-thirds of tail Lime Green (116) with Pistachio (101) bands; dorsal surface of distal portion of tail Tawny-Olive (17) with Drab (19) bands; ventral surface of head Pale Emerald Green (141); venter Light Lime Green (113); ventral surfaces of legs Whitish Lime Green (111); ventral surfaces of fingers and toes Grayish Horn Color (268); ventral surface of tail Pale Lime Green (112) on basal portion and Medium Lime Green (114) on central and distal portions; dewlap Pale Cyan (157) except for Cyan Black (154) posterior portion; iris Maroon (39). The coloration in life of another adult male (SMF 97860) from near Santo Domingo was recorded as follows: Dorsal and lateral surfaces of head Lime Green (116) with some Light Turquoise Green (146) scales; circumorbital region Light Turquoise Green (146); dorsal surface of body Parrot Green (121); dorsal surfaces of legs Apple Green (104) with Leaf Green (122) reticulum; dorsal surfaces of tail Apple Green (104) with Grass Green (110) bands; ventral surface of head Medium Paris White (140) with a Yellow–Green (103) reticulum; ventral surface of body Pale Lime Green (112) with a suffusion of Cyan White (156); ventral surfaces of legs Light Greenish White (98); ventral surface of tail on basal portion, Light Pistachio (101) on middle portion, and Pale Sulphur Yellow (92) on distal portion; dewlap Robin's Egg Blue (161) with a suffusion of Cyan Black (153) on posterior portion; iris Maroon (39).

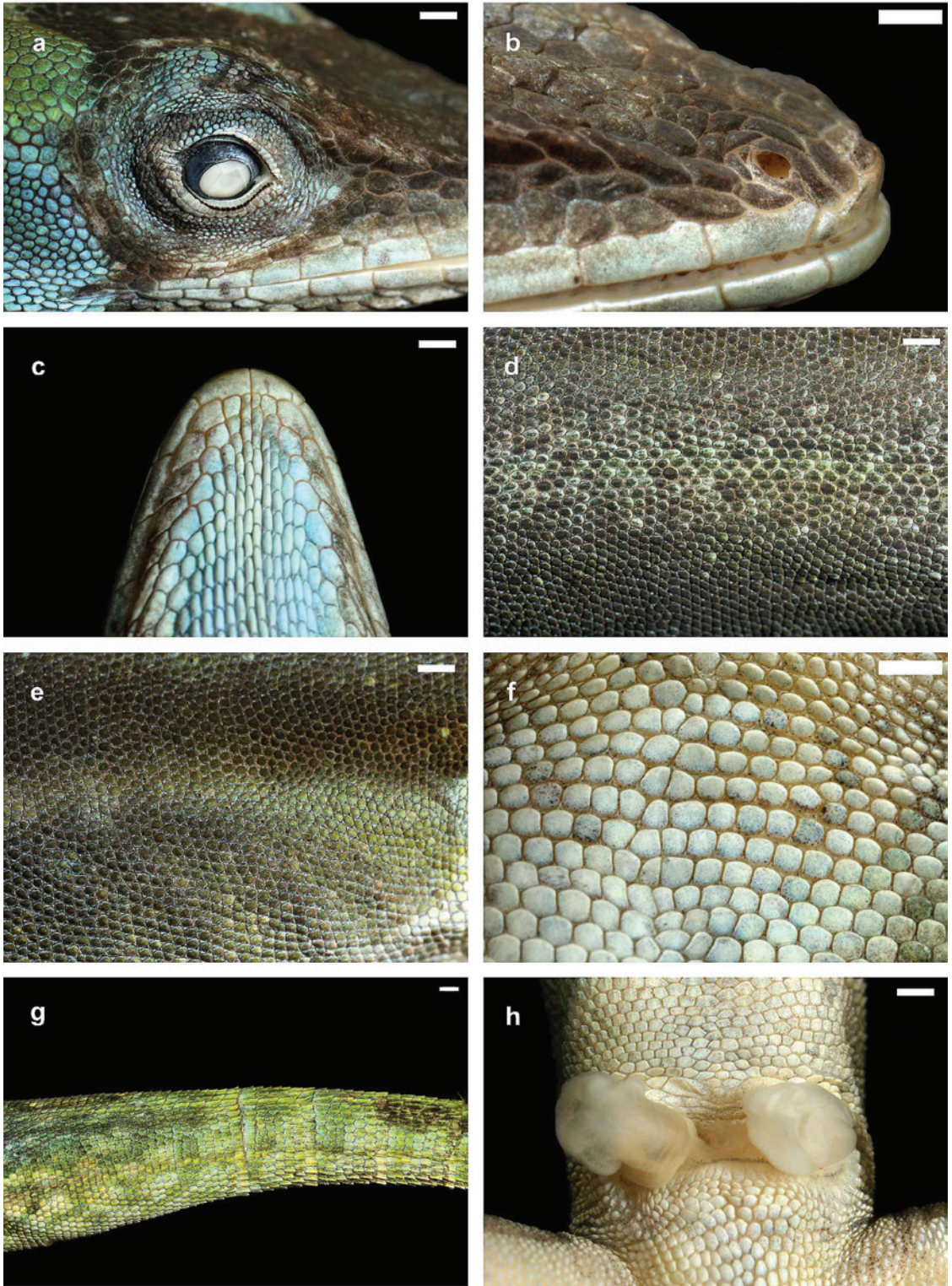


Figure 36. Neotype of *Anolis chlorocyanus* (SMF 97845). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region; (e) flank region; (f) midventer; (g) proximal portion of tail (lateral view); (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

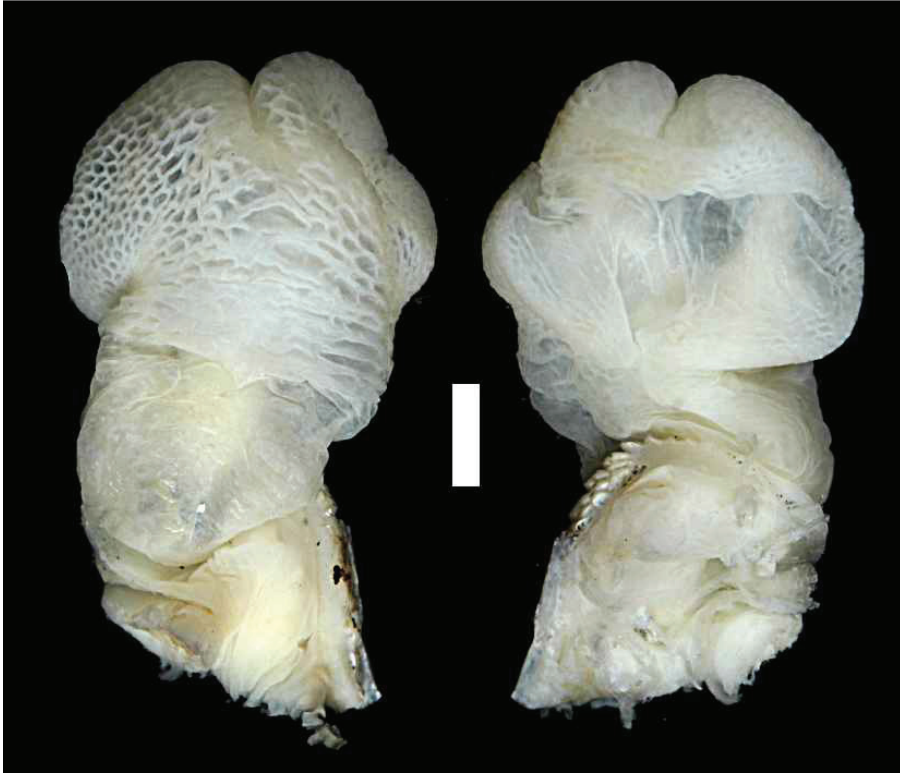


Figure 37. Hemipenis of *Anolis chlorocyanus* (SMF 97860). (left) sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

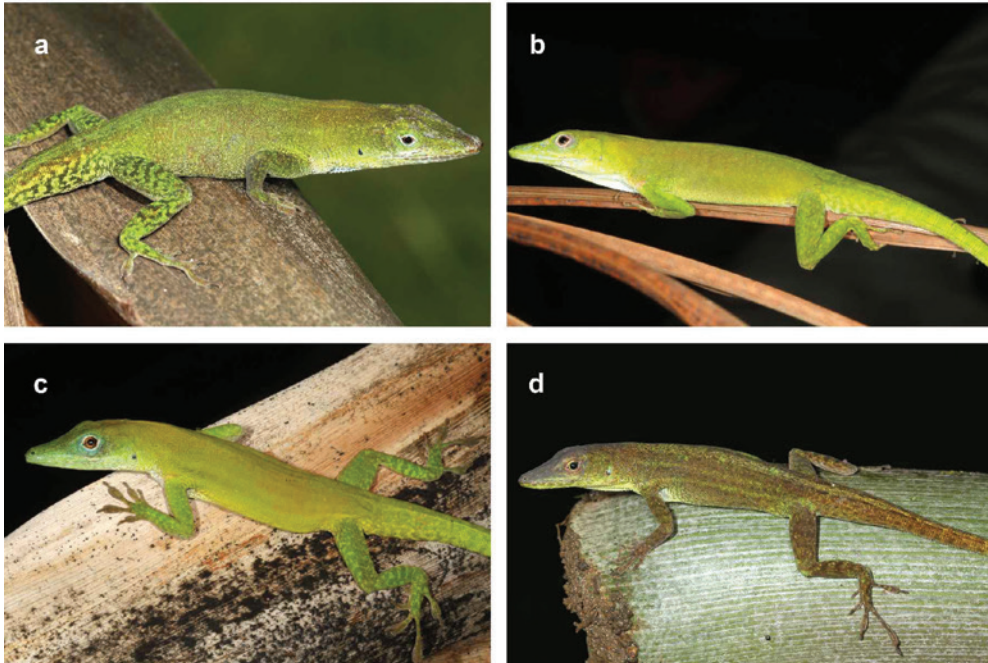


Figure 38. *Anolis chlorocyanus* in life. (a) SMF 97860; (b) SMF 97843; (c) SMF 97840; (d) SMF 97861. (a–c) are males, (d) is a female. Photos by G.K.

Geographic distribution. As currently known, *Anolis chlorocyanus* is widely distributed across eastern Hispaniola north and east of the Cordillera Central, Dominican Republic from near sea level to about 1400 masl (Fig. 40).

Natural history notes. *Anolis chlorocyanus* is a relatively common lizard where it occurs. They seem to prefer palm trees although they can be observed on any tree. At night GK encountered them sleeping on leafs, 2 to 4 m above the ground. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis chlorocyanus*” which under our concept is represented by four species (i.e., *A. chlorocyanus*, *A. cyanostictus*, *A. peynadoi*, and a species described below). For habitat images see Fig. 41.

Conservation. Given its usual abundance wherever this species occurs along with its relatively large geographical range, we consider the conservation status of *Anolis chlorocyanus* to be Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).

Specimens examined. Dominican Republic. Duarte: 3 km NE Villa Riva: KU 252102; Los Bracitos: AMNH 41482; El Seibo: El Seibo, 110 m: SMF 97838 (KJ566871, KJ566916), 97839–40; Espaillat: 8 km N San Victor: KU 316085; La Cantera: KU 298175; Moca: FMNH 10921, SMF 25917–19; Hato Mayor: 10.5 km N Hato Mayor: KU 252161; 2.1 mi N El Valle: KU 252298; 3.5 mi S Sabana de la Mar: KU 252297; Sabana de la Mar: KU 252220, SMF 26025, 26074, 26282; Hermanas Mirabal: Caño Hondo (San Lorenzo): AMNH 6164, 6166, 6168, 6170; La Altigracia: 2.6 mi NE La Vacama: KU 252168; 24.8 mi ESE Miches: KU 252347; 37 km SE Las Lisas: KU 252342; Boca de Chavon: KU 252108; Boca de Chavon, E side of river: KU 252263; Hotel Catalonia Bávaro, 10 m: SMF 97841 (KJ566872, KJ566917); Isla Saona, Mano Juan: KU 252237; Isla Saona, Mano Juan: KU 252238; Manatí Park Bávaro, 20 m: SMF 97843, GK-4686 (KJ566874, KJ566919); Reserva Ecológica Laguna Bávaro, 45 m: SMF 97842 (KJ566873, KJ566918); La Romana: Altos De Chavon: KU 316090; La Romana: AMNH 50090, 50092; Río Cumayasa, 15.5 mi E San Pedro de Macoris: KU 252175; La Vega: 1.5 mi NW La Vega: KU 252271; 10 km SE La Vega: KU 252272; 12 km NE Jarabacoa: KU 252109; 28.8 km E El Río, 2.0 km W of junction with main road: USNM 260270; 3.1 km N and 0.5 km Bonao: USNM 260272–73; 3.1 km N Bonao: USNM 260271; between Moca and La Vega: SMF 25910–12, 25958–59; Jarabacoa: SMF 25627, 25637–44, 25967–72, 26330; Jarabacoa, Hotel Pinar Dorado: KU 316133; Maria Trinidad Sanchez: 5 km NW Los Yayaes: KU 252280; Cano Abajo: KU 252188; Los Yayaes, 22.3 km WNW of Sanchez: USNM 260279–80; Monte Plata: 5 mi NE Gonzalo: KU 252208; Peravia: Nizao, 2.2 km NE Sabana Larga: KU 252189; Puerto Plata: 1.0 km W Yaroa, trail to Loma Indio Viejo: USNM 260281; Río Muñoz, 7 km from Puerto Plata: SMF 25907; road to Moca, 1 km S coastal highway: KU 316138; Sosua: FMNH 42173, KU 252117; San Cristóbal: 3 km SE Yamasa: KU 252118; Samaná: El Limón, Peninsula Samaná, 30 m: GK-4719 (KJ566876, KJ566921), SMF 97844 (KJ566875, KJ566920); Bahia Principe El Portillo, Peninsula Samaná, 10 m: SMF 97846 (KJ566877, KJ566922); Santa Bárbara de Samaná: SMF 26060–61; near Samaná, ¼ mile on Sanchez Road, 2 mi out of Samaná: AMNH 42316; Sanchez: AMNH 6055, 6061, 6063, 6067, 6146, 6200, FMNH 5980 (1–10), KU 252203; 2 km E Las Terrenas: KU 252350; 5 mi NW Sanchez: KU 252202, Caba: KU 252351; Santa Bárbara de Samaná: FMNH 28240; San Pedro de Macoris: 14 mi E Boca Chica: KU 252383; 51 km E Ciudad Trujillo: FMNH 60258; Consuelo: AMNH 50140, SMF 25727; Gran Bahia Principe La Romana, 10 km E San Pedro de Macoris, 10 m: SMF 97836 (KJ566870, KJ566915), 97837; San Pedro de Macoris: SMF 25708; Sanchez Ramirez: 12.3 km E Cotui: KU 252380; Santiago: 1.5 km E Santiago: KU 252154; pass between Santiago and Puerto Plata: SMF 25866–67; Río Bao, 3.4 mi SE Los Montones: KU 252211; Santo Domingo: 0.5 km NW Tres Ojos: KU 252218; 1 km E Boca Chica: KU 252101; 2.1 km NE Guerra: KU 252096; above La Isabela, Río Isabela: SMF 25742–44; Hotel Be Live Hamaca, Boca Chica,

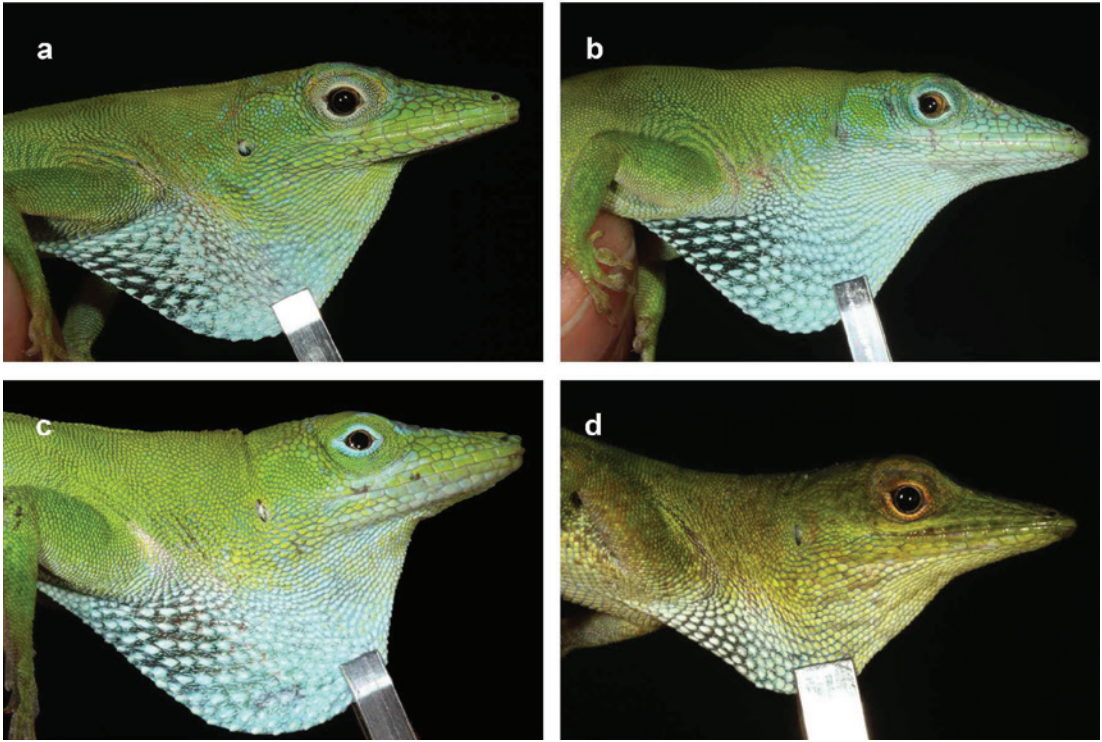


Figure 39. Dewlaps of *Anolis chlorocyanus* in life. (a) SMF 97838; (b) SMF 97845; (c) SMF 97860; (d) GK-4686. (a–c) are males, (d) is a female. Photos by G.K.

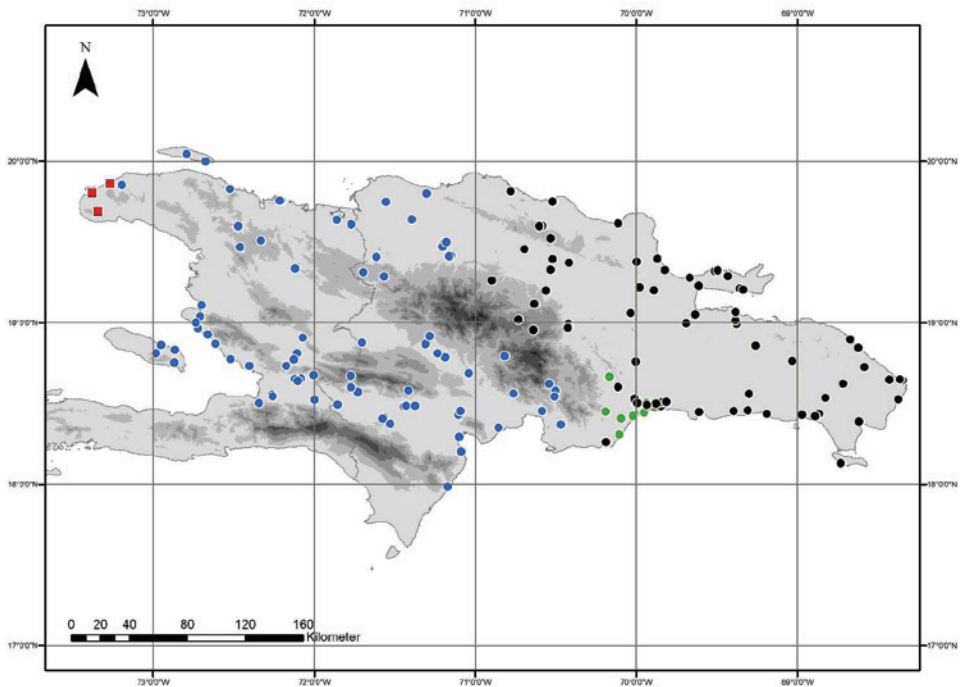


Figure 40. Map indicating collecting localities of the species in the *Anolis chlorocyanus* species group. Each symbol can represent one or more adjacent localities. Areas above 500 and 1000 m are shaded medium dark and dark gray, respectively. Black circles: *Anolis chlorocyanus*; blue circles: *A. peynadoi*; green circles: *A. cyanostictus*; red squares: *A. leucodera* sp. nov.

10 m: SMF 97847 (KJ566879, KJ566924); Hotel Don Juan, Boca Chica, 10 m: GK-4738 (KJ566878, KJ566923); km 17 Autopista Duarte, north of Santo Domingo, 55 m: SMF 97858 (KJ566860), 97859–60, 97861 (KJ566861, KJ566906), 97862 (KJ566862, KJ566907); Santo Domingo, Avenida Máximo Gómez at El Edén: KU 316079; Santo Domingo, Los Peralejos: KU 316081; Santo Domingo, Urbano Máximo Gómez: KU 316083; Valverde: Los Quemados, Río Gurabo: AMNH 16180.



Figure 41. Habitat of *Anolis chlorocyanus* (a) km 17 Autopista Duarte, north of Santo Domingo (18.52900 -70.00996, 55 m), Santo Domingo Province, Dominican Republic, 4 November 2013; (b) El Limón, Península de Samaná (19.28929, -69.43118, 30 m), Samaná Province, Dominican Republic, 21 October 2013. Photos by G.K.

Anolis cyanostictus Mertens, 1939

Figs. 42–45

Anolis chlorocyanus cyanostictus Mertens, 1939: 64; type locality: “Zwischen Fortaleza und der Mündung des Rio Jaina”, Santo Domingo, Dominican Republic. Holotype: SMF 26290. Schwartz & Thomas, 1975; Schwartz & Henderson, 1988; Schwartz & Henderson, 1991; Ramos & Powell, 2001a; Henderson & Powell, 2009.

Anolis chlorocyanus: Williams, 1965 (in part.); Schwartz, 1980 (in part.); Powell *et al.*, 1996 (in part.).

Anolis chloro-cyanus: Barbour, 1930 (in part.); Barbour, 1935 (in part.); Barbour, 1937 (in part.); Cochran, 1941 (in part.).

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except a species described below (i.e., our Species D of this species complex) by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody weakly keeled; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap with large and irregularly arranged gorgetals, especially on posterior portion of dewlap. Among the *Anolis* species treated in this contribution, *A. cyanostictus* is most similar to *A. chlorocyanus*, *A. peynadoi*, and a species described below (i.e., our Species D of this complex). *Anolis cyanostictus* differs from *A. chlorocyanus* and *A. peynadoi* by (1) the absence of suffusion of black pigment on posterior portion of the male dewlap (vs. the posterior portion of the male dewlap heavily suffused with black in *A. chlorocyanus* and *A. peynadoi*); and (2) by having pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches absent in *A. chlorocyanus* and *A. peynadoi*); and (3) weakly keeled ventrals at midventer (vs. smooth in *A. chlorocyanus* and *A. peynadoi*). *Anolis cyanostictus* differs from the species related to *A. coelestinus* by having (1) a bicolored dewlap with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales (vs. dewlap yellowish green or brown in life dewlap with longitudinal or oblique double rows of gorgetal scales); (2) 13–30, usually <28 loreal scales in a maximum of 3–5 rows (vs. 18–60, usually >28 loreal scales in a maximum of 3–7 rows); and (3) a brown to reddish brown iris in life (vs. a blue iris). *Anolis cyanostictus* differs from the species related to *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. cyanostictus* and the species described below, see account of the new species.

Description. *Anolis cyanostictus* is a moderate-sized to moderately large anole (maximum recorded SVL 70.0 mm in males, 52.0 in females); dorsal head scales in internasal region keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 3 to 5 postrostrals; 3 to 7 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 to 2 scale rows at narrowest point; supraorbital disc composed of 2 to 6 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 complete row of circumorbital scales usually

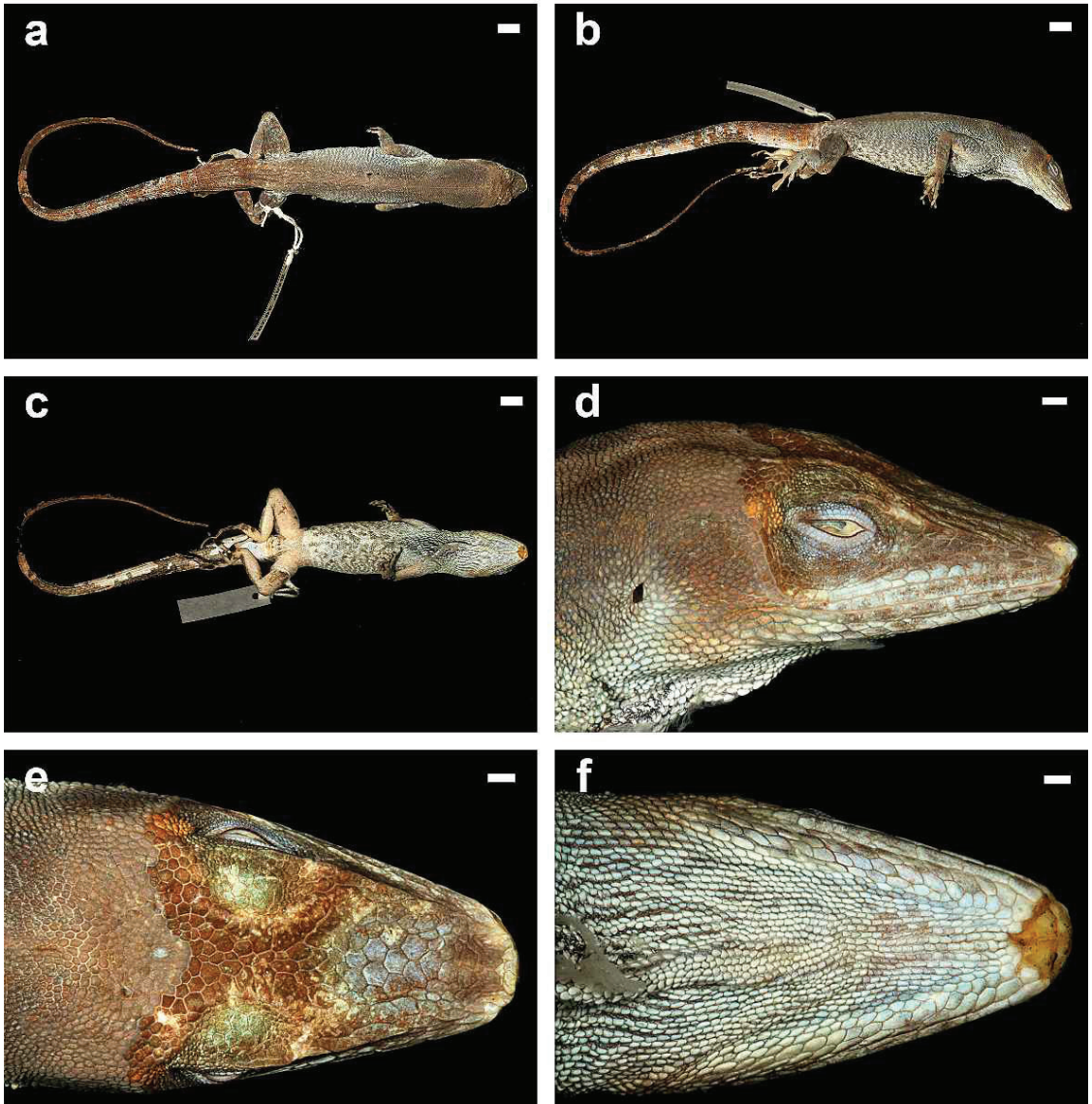


Figure 42. Holotype of *Anolis cyanostictus* (SMF 26290). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

present, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate to deep parietal depression present; interparietal scale well developed, slightly smaller to considerably larger than ear opening, surrounded by scales of moderate size; 2 to 4 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 6 to 10 scales present between second canthals; 7 to 11 scales present between posterior canthals; 13 to 30 mostly keeled loreal scales in a maximum of 3 to

5 horizontal rows; 4 to 5 keeled subocular scales arranged in a single row; 6 to 8 supralabials to level below center of eye; 4 to 6 suboculars broadly in contact with 3 to 6 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 4 to 8 postmentals, outer ones slightly to moderately larger than median ones; 5 to 8 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; gorgetal scales more or less arranged in rows, central and anterior gorgetal scales smaller and narrower spaced than those on posterior portion of dewlap; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 38 to 64 medial dorsal scales in one head length; 57 to 94 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size; ventrals at midbody subimbricate and smooth to faintly keeled, occasionally with groups of distinctly keeled scales; about 34 to 50 medial ventral scales in one head length; 52 to 65 medial ventral scales between levels of axilla and groin; 106 to 132 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.017–0.028; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 38 to 49 lamellae under phalanges II–IV of Toe IV of hind limbs; 7 to 8 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

The completely everted hemipenis (SMF 99016; Fig. 44) is a small unilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; no asulcate ridge and no asulcate processus; apex strongly calyculate, truncus and asulcate ridge with transverse folds.

The coloration in life of an adult male (SMF 99014) was recorded as follows: Dorsal and lateral surfaces of head Leaf Green (122) with a Dark Drab (45) blotch behind eye and a Light Cyan (158) circumorbital region; dorsal and lateral surfaces of body Parrot Green (121) with Clay Color (18) suprascapular and prescapular blotches; dorsal and lateral surfaces of limbs Parrot Green (121) with Lime Green (116) speckles; dorsal surface of tail Parrot Green (121) with Pistachio (102) speckles on anterior portion and band on middle portion; distal portion of tail suffused with Grayish Horn Color (268) and Yellow Ocher (14), tip of tail Buff (15); ventral surface of body Medium Lime Green with Bunting Green (120) speckles; ventral surfaces of legs Light Greenish White (98); ventral surface of tail on anterior and middle portions Lime Green (105) with Sepia (286) bands and speckles, on distal portion Burnt Sienna (38) with Sepia (286) bands and speckles, tip of tail Sulphur Yellow (91); dewlap Citrine (119) with Medium Lime Green (114) gorgetal scales and Light Turquoise Green (146) anterior and distal margins; iris Warm Sepia (40) with a Sayal Brown (41) inner ring.

Geographic distribution. As currently known, *Anolis cyanostictus* is restricted to the general area of Santo Domingo and nearby towns from near sea level to about 100 masl (Fig. 40).

Natural history notes. The type series of *Anolis cyanostictus* was collected on coconut trees but other individuals of this species were observed also on various kinds of trees and on fence posts (Mertens 1939). Henderson and Powell (2009) provided a summary of the natural history of “*Anolis chlorocyanus*” which under our concept is represented by four species (i.e., *A. cyanostictus*, *A. peynadoi* and two species described below). See Fig. 46 for the habitat of this species.

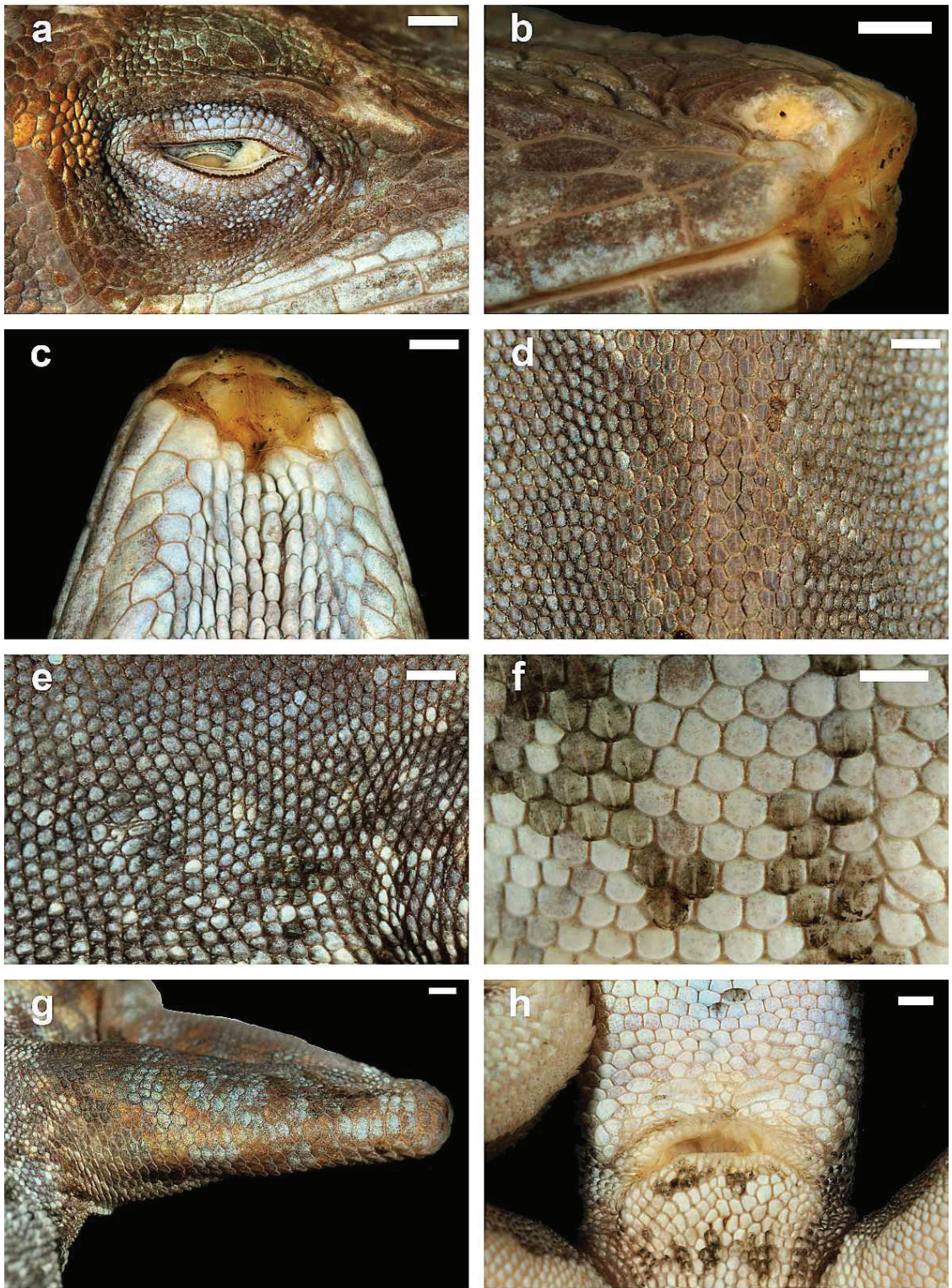


Figure 43. Holotype of *Anolis cyanostictus* (SMF 26290). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region; (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

Conservation. We do not have evidence that the species is threatened or declining within its range. However, given the small range size and the fact that it occurs in a populated area suggests that it may be threatened by encroaching urban areas. For this reason, we consider the conservation status of *Anolis cyanostictus* to be Near Threatened based on the IUCN Red List Categories and Criteria (IUCN, 2012).

Specimens examined. Dominican Republic. San Cristóbal: 1 km SE Cambita Garabitos: KU 252126–27; 2 km SE San Cristobal: KU 252119; 4.2 mi NE Sabana Grande de Palenque: KU 252283; Finca Arbol Fordo, near Villa Altagracia: SMF 26112–13; W end of Puente Troncoso and W along Río Haina: KU 316142; vicinity of La Altagracia, W Santo Domingo, 40 m: SMF 99014 (KP757877, KP757880), 99015 (KP757878, KP757881), 99016 (KP757879, KP757882); Santo Domingo: 5.4 km N from Datsun Building in Santo Domingo on Carretera Duarte: MCZ R-151498, 151509, 151492; Ciudad Trujillo: SMF 22957–60, 25545, 25555, 25608–09, 25956; mouth of Río Haina: SMF 25535–38, 25551, 26290, 26338; Río Haina River Club: KU 316069; Santo Domingo, Hotel Naco: KU 316071; Santo Domingo, Parque Mirador Del Sur: KU 316073; Santo Domingo, Paseo Puente Bellini at Calle Arzobispo Merino: KU 316082.

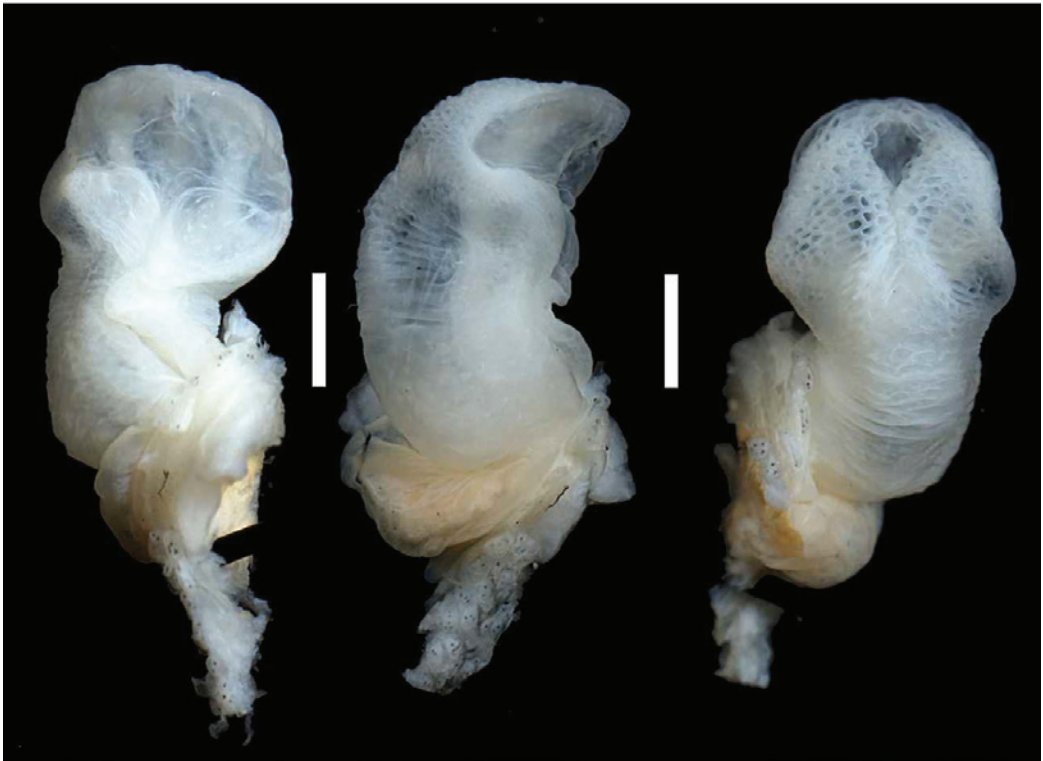


Figure 44. Hemipenis of *Anolis cyanostictus* (SMF 99016). (left) Sulcate view; (center) lateral view; (right) asulcate view. Scale bars equal 1.0 mm. Photos by G.K.

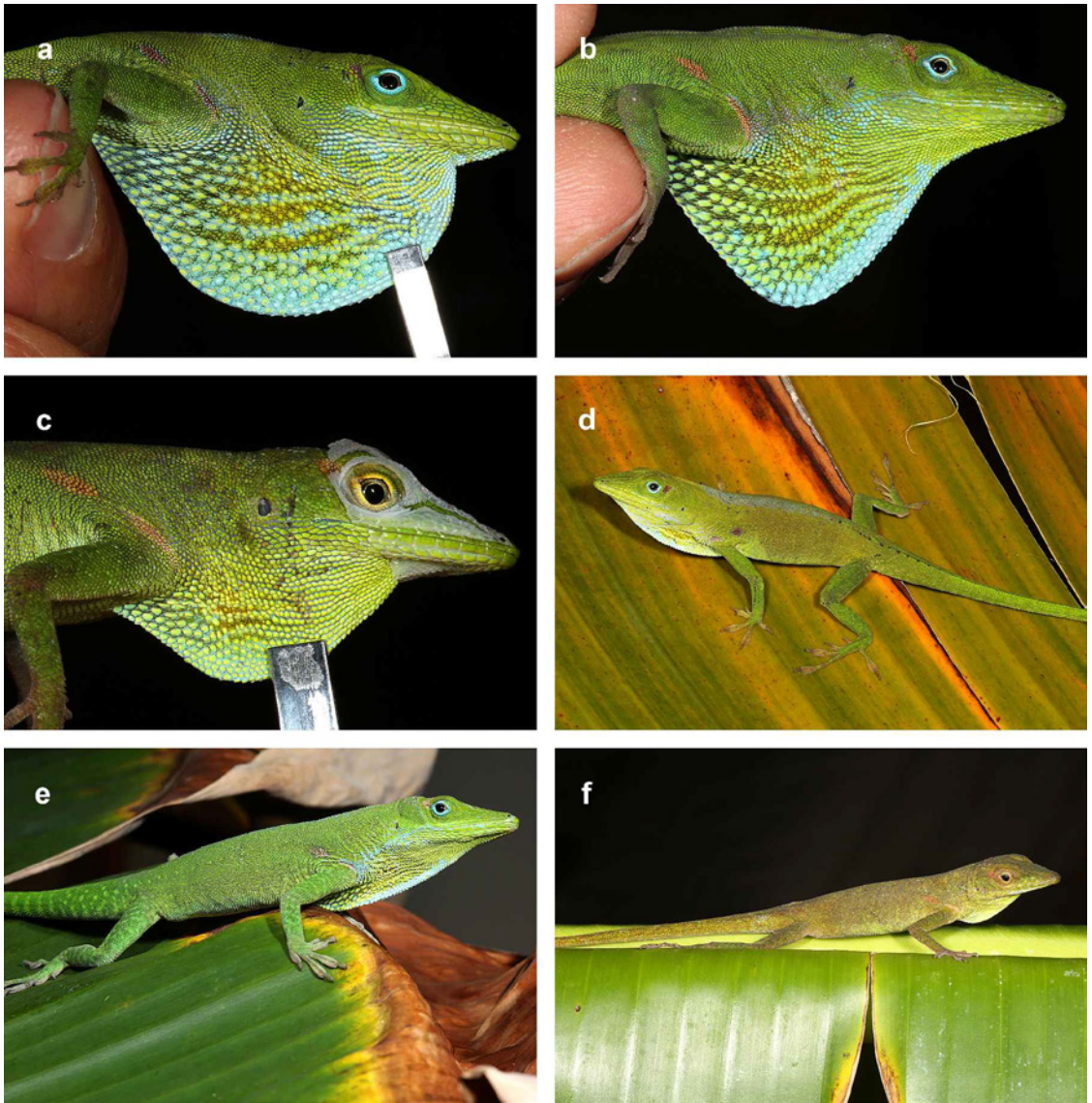


Figure 45. *Anolis cyanostictus* in life. (a) SMF 99016; (b) SMF 99014; (c) SMF 99015; (d) SMF 99016; (e) SMF 99014; (f) SMF 99015. (a,b,d,e) are males, (c and f) are females. Photos by G.K.



Figure 46. Habitat of *Anolis cyanostictus* near La Altagracia, 18.44004°, -69.99910°, 40 m. Photo by G.K.

Anolis peynadoi Mertens, 1939

Figs. 47–50

Anolis chlorocyanus peynadoi Mertens, 1939: 65; type locality: “Südlich von Fondo Negro, unterer Rio Yaque del Sur”, Santo Domingo, Dominican Republic. Holotype: SMF 26201.

Anolis chlorocyanus: Williams, 1965 (in part.); Schwartz, 1980 (in part.); Powell *et al.*, 1991; García *et al.*, 1994; Powell *et al.*, 1996 (in part.).

Anolis chlorocyanus chlorocyanus: Schwartz & Thomas, 1975 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Ramos & Powell, 2001a (in part.); Henderson & Powell, 2009 (in part.).

Anolis chloro-cyanus: Barbour, 1930 (in part.); Barbour, 1935 (in part.); Barbour, 1937 (in part.); Cochran, 1941 (in part.).

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except a species described below (i.e., our Species D of this species complex) by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) a white subocular stripe and a white streak onto lateral neck usually present, most obvious in life (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) 39–47 subdigital lamellae on Phalanges II–IV of Toe IV of hind

limbs; (6) male dewlap bluish green or brown (after metachrosis) with a suffusion of black pigment on posterior portion and with cream to yellow on anterior portion in life, gorgetals large and irregularly arranged, especially on posterior portion of dewlap. Among the *Anolis* species occurring treated in this contribution, *A. peynadoi* is most similar to *A. chlorocyanus*, *A. cyanostictus* and a species described below (our Species D of this complex). *Anolis peynadoi* differs from *A. chlorocyanus* and *A. cyanostictus* by (1) having the the posterior portion of the dewlap skin in males solid black with widely spaced gorgetal scales (vs. only a weak suffusion of black pigment on the posterior portion of the male dewlap with less widely spaced gorgetal scales in *A. chlorocyanus*); (2) a white streak on upper lip usually present, most obvious in life (vs. no white streak in *A. chlorocyanus*); (3) a more robust habitus (vs. a more slender habitus in *A. chlorocyanus*). *Anolis peynadoi* differs further from *A. chlorocyanus* by having moderately to greatly enlarged outer postmental scales, about three time the size of adjacent medial scales (vs. slightly to moderately enlarged outer postmental scales, less than three time the size of adjacent medial scales in *A. chlorocyanus*). *Anolis peynadoi* differs further from *A. cyanostictus* by the absence of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*) and by having smooth ventrals at midventer (vs. slightly keeled in *A. cyanostictus*). *Anolis peynadoi* differs from the species related to *A. coelestinus* by having (1) a bicolored dewlap with a darker posterior portion and with regularly spaced more or less homogeneous gorgetal scales (vs. dewlap yellowish green or brown in life dewlap with longitudinal or oblique double rows of gorgetal scales); (2) 17–21, usually <28 loreal scales in a maximum of 3–4 rows (vs. 18–60, usually >28 loreal scales in a maximum of 3–7 rows); and (3) a brown to reddish brown iris in life (vs. a blue iris). *Anolis peynadoi* differs from the species related to *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life). For differences between *A. peynadoi* and the species described below, see account of the new species.

Description. *Anolis peynadoi* is a moderate-sized to moderately large anole (maximum recorded SVL 75.5 mm in males, 55.0 in females); dorsal head scales in internasal region keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 5 to 6 postrostrals; 6 to 7 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in moderate prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 0 to 1 scale rows at narrowest point; supraorbital disc composed of 2 to 5 slightly to moderately enlarged, keeled scales arranged in 3 to 4 rows; usually 1 complete row of circumorbital scales usually present, therefore, enlarged supraorbital scales usually separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate to deep parietal depression present; interparietal scale well developed, slightly smaller to considerably larger than ear opening, surrounded by scales of moderate size; 3 to 4 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 6 to 8 scales present between second canthals; 7 to 11 scales present between posterior canthals; 15 to 24 mostly keeled loreal scales in a maximum of 3 to 4 horizontal rows; 4 to 5 keeled subocular scales arranged in a single row; 6 to 8 supralabials to level below center of eye; 4 to 5 suboculars broadly in contact with 3 to 5 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 4 to 6 postmentals, outer ones slightly to moderately larger than median ones; 6 to 8 infralabials to level below center of eye; sublabials not differentiated; keeled granular scales present on

chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; gorgetal scales more or less arranged in rows, central and anterior gorgetal scales smaller and narrower spaced than those on posterior portion of dewlap; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 36 to 48 medial dorsal scales in one head length; 57 to 72 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size; ventrals at midbody subimbricate and usually smooth; about 35 to 45 medial ventral scales in one head length; 52 to 66 medial ventral scales between levels of axilla and groin; 107 to 130 scales around midbody; all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.018–0.025; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 39 to 44 lamellae under phalanges II–IV of Toe IV of hind limbs; 6 to 8 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

The completely everted hemipenis (FMNH 224935; Fig. 50) is a small, slightly bilobed organ; sulcus spermaticus bordered by well developed sulcal lips and opening into two large apical fields void of ornamentation, one on each lobe; asulcate apex surface extensively calyculate; a prominent asulcate ridge present.

Geographic distribution. As currently known, *Anolis peynadoi* is widely distributed across western Hispaniola south and west of the Cordillera Central from near sea level to about 940 masl (Fig. 40).

Natural history notes. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis chlorocyanus*” which under our concept is represented by four species (i.e., *A. chlorocyanus*, *A. cyanostictus*, *A. peynadoi*, and a species described below). Fig. 51 shows the habitat of *Anolis peynadoi* 12 km east of Thomazeau, Département Dept. de l’Ouest, Haiti.

Conservation. Given its usual abundance wherever this species occurs along with its relatively large geographical range, we consider the conservation status of *Anolis peynadoi* to be Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).

Specimens examined. Dominican Republic. Azua: 1.8 mi W, 13.3 mi N Azua: KU 252158; 15.2 km E Azua: KU 252291; 2 km W Puerto Viejo: KU 252217; 4 km N Las Lomas: KU 252159; Río Yaque Del Sur 3 km N Villarpando: KU 316029; Bahoruco: 0.7 mi E El Estero: KU 252079; 1 km W Neiba: KU 316036; 5 km E Neiba: KU 316037; Apolinar Perdomo, 900 m: USNM 558727; south of Fondo Negro, lower Río Yaque del Sur: SMF 26201, SMF 26209–10; Barahona: 9.5 km N Barahona: KU 316058; Barahona: USNM 558728–29; El Higuito, 1.6 mi NE Fondo Negro: KU 252160; Paraíso: KU 316068; Dajabón: 1 km S Loma de Cabrera: KU 252090; 2 km NW Villa Anacaona: KU 252292; Restauración: KU 252293–94; Elías Pina: 5.6 km NW Río Limpio: KU 252172; Independencia: 3.6 mi NW Duvergé: KU 252163; 6 km NW Duvergé: KU 252299; 8 km N Los Pinos: KU 252328; Duvergé: AMNH 41327; La Descubierta: AMNH 41435; Las Baitoas near Duvergé, near Lake Enriquillo: AMNH 50181, 50183, 50185, KU 252228; Los Pinos: KU 252317; Puerto Escondido: KU 252305; Tierra Nueva: KU 252329; Monte Cristi: 1 km S Palo Verde: KU 252110; 4 km S Guayubín, S of Monte Cristi: AMNH 42180; Peravia: 1.9 km N Cruce de Ocoa, on San José de Ocoa road, 163 m: SMF 98169, USNM

558726; San José de Ocoa: 1.3 mi S San José de Ocoa: KU 252196; 8 km SW Rancho Arriba: KU 252349; San José de Ocoa: KU 252281; San Juan: 1.8 mi SW San Juan: KU 252210; 15 km SE San Juan: KU 252382; 4.1 mi NW Juan de Herrera: KU 252209; San Juan, W edge: KU 252150–51; Santiago Rodríguez: 1.8 mi W Los Quemados: KU 252216; 2 km E Monción: KU 252155; 9.1 mi E Santiago Rodríguez: KU 252215; Monción: SMF 25766–67, 25772–73. Haiti: Artibonite: 0.8 mi E Carrefour Marmelade: KU 251942; 1.6 mi NW Mont Rouis: KU 251938; 3 mi S of Ennery on road to Gonaives: AMNH 49844; 7.4 mi N Mont Rouis: KU 251940–41; Pierre Payen, 9 mi S Saint Marc: KU 251955; Plaisance: SMF 10957–62; Saint Marc: AMNH 49669, 49671, 49673; Centre: 1.6 km SW Triano: KU 252041; 17.6 km N Terre Rouge, 150 m:

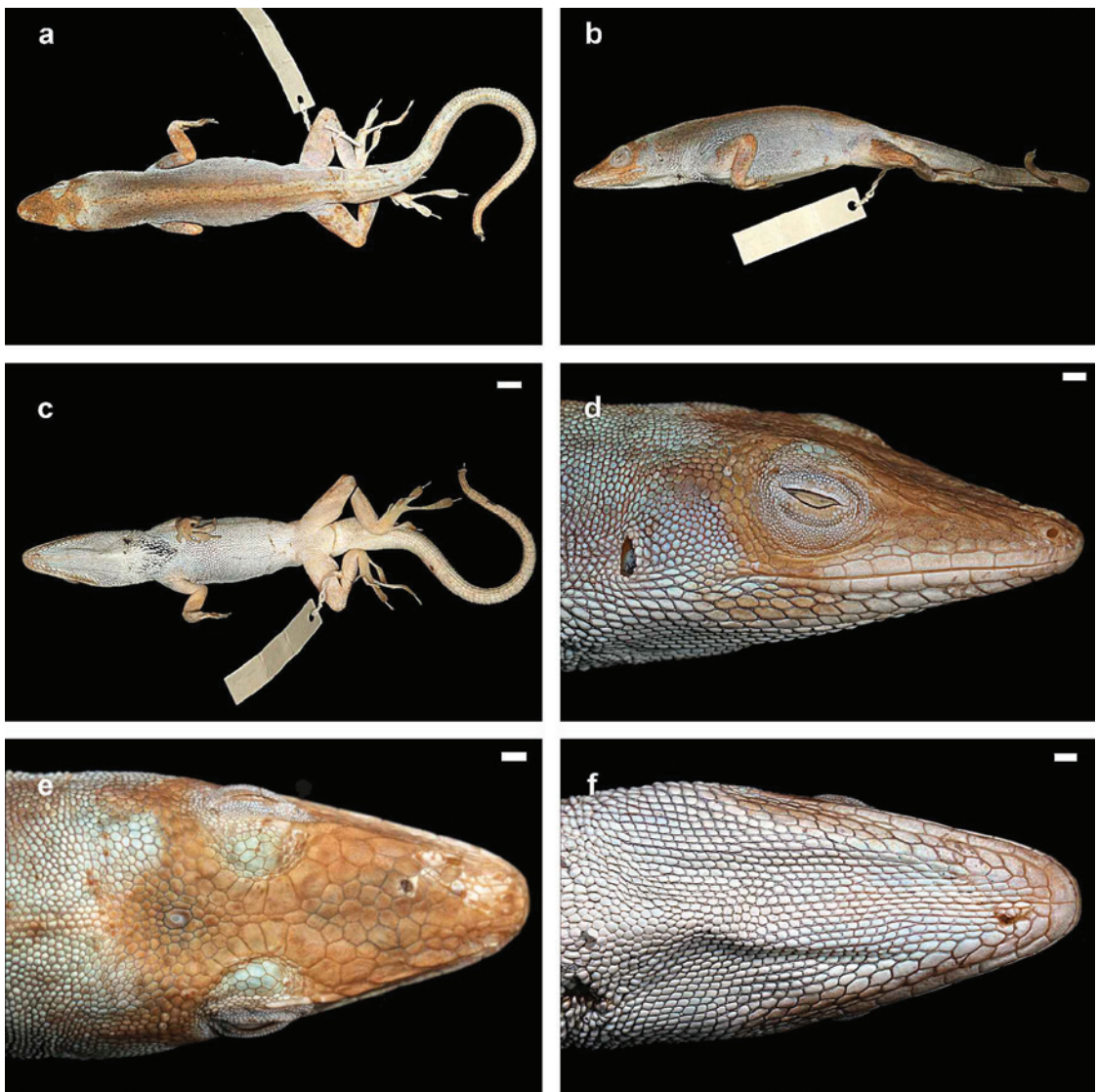


Figure 47. Holotype of *Anolis peynadoi* (SMF 26201). (a) dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

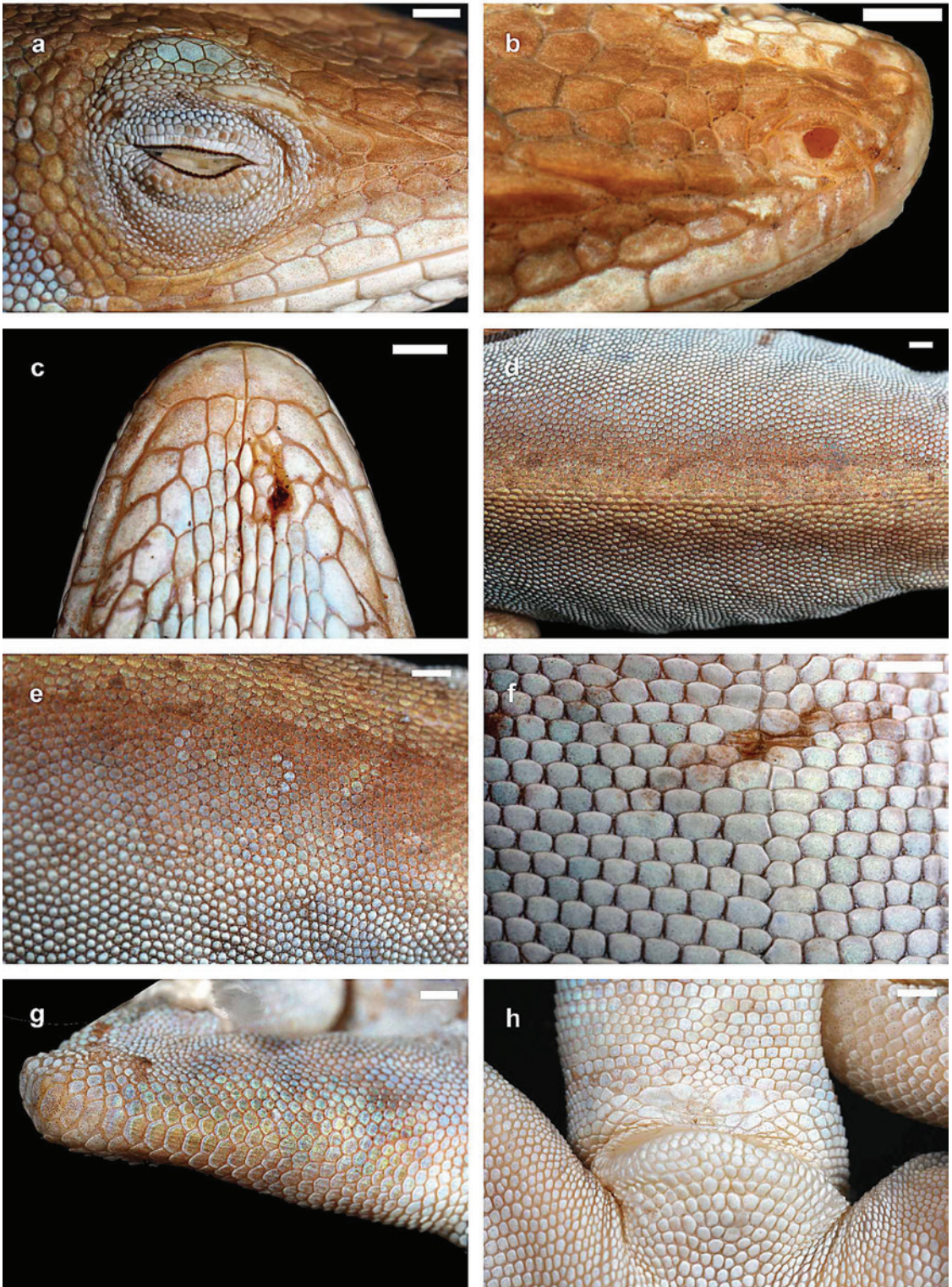


Figure 48. Holotype of *Anolis peynadoi* (SMF 26201). (a) superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

SMF 98184, USNM 558734; 5.7 mi S Mirebalais: KU 252039; 7 mi N Mirebalais: KU 252029; Nord: Pignon: FMNH 224935; Nord'Est: 5.2 mi NW Ouanaminthe: KU 251956; 6.3 mi E Terrier Rouge: KU 251967–68; Nord'Ouest: Île de la Tortue: MCZ R-37417, 37419; Palmiste, Île de la Tortue: KU 252073; Ouest: 0.5 mi NW Arcahaie, intersection on coast road: KU 251991; 0.7 mi E Thomazeau: KU 252001; 0.9 mi SE Duvalierville: KU 251981; 1.7 mi E Trou Caiman (village): KU 252008; 18.1 km E Thomazeau, 800 m: SMF 98177–83, USNM 558730, USNM 558731 (KJ566816, KJ566887), USNM 558732–33; 5.5 km SE Montrouis: USNM 239374–75; 9.5 mi NW Arcahaie: KU 252020; Anse-a-Galets, Île de la Gonave: KU 252057–58; Bois de Chene, south of Port-au-Prince: KU 98174; btw. Caiman and Eaux Gaillees: KU 252040; Etroits, Île de la Gonave: KU 252045; Fond Michelle: KU 252010; Île de la Gonave, near Nan Café, 442 m: USNM 558736 (genetic sample: 4: KJ566851, KJ566903); Île de la Gonave: FMNH 60241; Île de la Gonave, Source Picme, near Platon Balais, 205 m: SMF 98185 (KJ566848, KJ566902), USNM 558735; La Source Fond Parisien, ca 1 mi NE Fond Parisien: KU 251992; Port-au-Prince: AMNH 22608, FMNH 42547–48, 224934, SMF 10963; Tabarre, 3.2 mi SE Francois Duvalier Airport: KU 252043; Terre Rouge, 13 mi S Mirebalais: KU 251922.

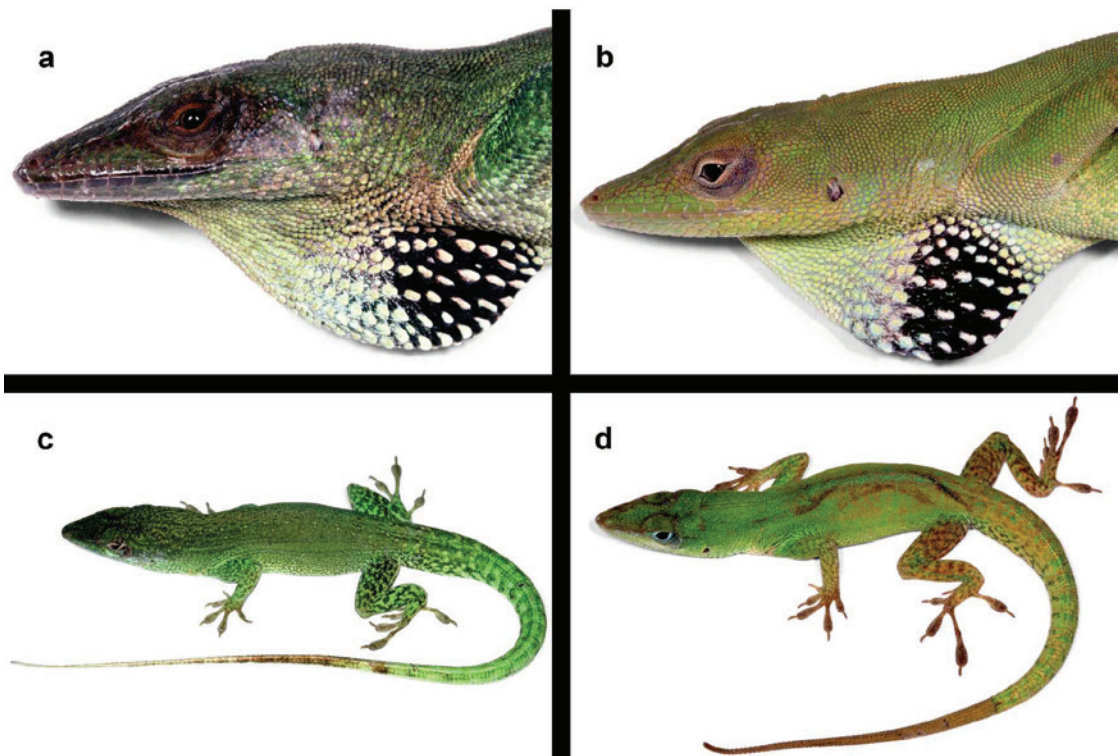


Figure 49. *Anolis peynadoi* in life (all males, specific specimen numbers not given). (a and c) From Rio Limpio, Elias Pina Province, Dominican Republic; (b and d) from Barahona, Barahona Province, Dominican Republic. Photos by S.B.H.

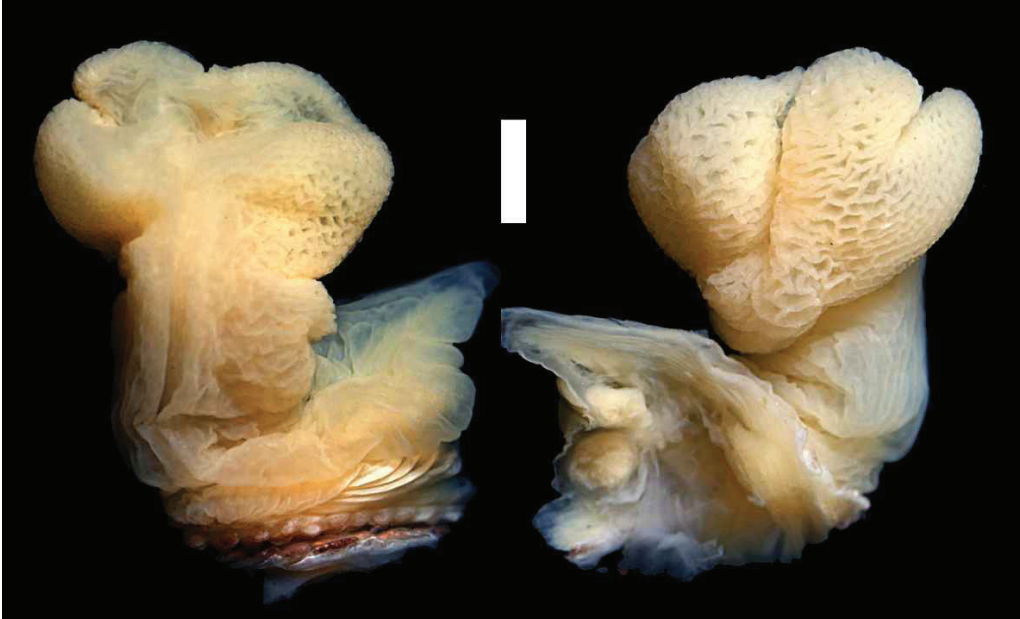


Figure 50. Hemipenis of *Anolis peynadoi* (FMNH 224935). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.



Figure 51. Habitat of *Anolis peynadoi* 12 km east of Thomazeau, Département Dept. de l'Ouest, Haiti. Photo by S.B.H. on 24 July 1991.

Anolis leucodera sp. nov.
Figs. 52–53

Anolis chlorocyanus: Williams, 1965 (in part.); Schwartz, 1980 (in part.); Powell *et al.*, 1996 (in part.).

Anolis chlorocyanus chlorocyanus: Schwartz & Thomas, 1975 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Ramos & Powell, 2001a (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 98030, an adult male from Môle Saint Nicolas (19.80583, -73.37556), near sea level, Département de Nord'Ouest, Haiti; collected 27 April 1997 by S. Blair Hedges, Richard Thomas, and Felix Charles. Field tag number USNM FS (field series) 194567.

Paratypes. All from Département de Nord'Ouest, Haiti: USNM 558723 (genetic sample: KJ566833, EF531489), same collecting data as holotype; SMF 98173–74, USNM 558720–22), 9.1 mi NE Môle Saint Nicolas at Rivière Côtes de Fer (19.86173, -73.26586), 30 m, collected 26 April 1997 by S. Blair Hedges, Richard Thomas, and Felix Charles; SMF 98175, Bombardopolis (19.69135, -73.34209), 490 m, collected 27 April 1997 by S. Blair Hedges and Richard Thomas; KU 251978, Môle Saint Nicolas (19.80569, -73.37619), collected 4 June 1979 by natives and given to Albert Schwartz.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak on lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody faintly to weakly keeled; (5) 40–46 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap bluish green or brown (after metachrosis) in life without a suffusion of black pigment on posterior portion, gorgetals large and irregularly arranged, especially on posterior portion of dewlap; (7) ratio tail length / SVL >1.7, usually >2.0. Among the *Anolis* species occurring treated in this contribution, *A. leucodera* is most similar to *A. chlorocyanus*, *A. cyanostictus*, and *A. peynadoi* from which it differs by the absence of suffusion of black pigment on the dewlap (vs. posterior portion of dewlap moderately to heavily suffused with black pigment in *A. cyanostictus*, *A. chlorocyanus*, and *A. peynadoi*). *Anolis leucodera* differs further from *A. chlorocyanus* and *A. peynadoi* by having faintly to weakly keeled ventrals (vs. smooth in *A. chlorocyanus* and *A. peynadoi*). *Anolis leucodera* differs further from *A. cyanostictus* by the lack of pale brown blotches above and anterior to shoulder as well as immediately posterior to eye (vs. such blotches present in *A. cyanostictus*). *Anolis leucodera* differs further from *A. peynadoi* by the lack of a white streak on upper lip (vs. a white streak usually present in *A. peynadoi*, most obvious in life). *Anolis leucodera* differs from the species related to *A. coelestinus* by having (1) 12–17 loreal scales in a maximum of 3 rows (vs. 18–48, usually >28 loreal scales in a maximum of 3–7 rows); (2) the absence of a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. such stripe and streak present or absent); and (3) a brown to reddish brown iris in life (vs. a blue iris). *Anolis leucodera* differs from the species related to *A. aliniger* and *A. singularis* by (1) having a longer tail with a ratio tail length / SVL >1.7, usually >2.0 (vs. <1.7); (2) a distinct white subocular stripe that continues as a white streak onto lateral neck (vs. no such stripe and streak); (3) usually >38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; and (4) no conspicuously dark colored distal portion of tail in front of pale colored tail tip (vs. such a tail color pattern present, most obvious in life).

Description of the holotype. Adult male, as indicated by everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 73.0 mm; tail length 154.0 mm (complete); tail slightly depressed in cross section, tail height 5.0 mm and width 6.1 mm; axilla to groin distance 30.7 mm; head length 21.0 mm, head length/SVL ratio 0.29; snout length 10.6 mm; head width 11.1 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 16.7 mm, shank length/head length ratio 0.80; longest finger of extended forelimb reaching to a point 3.8 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 4.5 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region keeled, uncarinate; other dorsal head scales smooth, rugose, or keeled; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with both rostral and first supralabial; scales in shallow prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 3 to 4 moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 to 3 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a deep parietal depression present; interparietal scale well developed, 1.7 x 1.0 mm (length x width), surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 5 large and 2 small anterior canthal scales; 8 scales present between second canthals; 7 scales present between posterior canthals; 17 mostly keeled loreal scales in a maximum of 3 horizontal rows; 4 keeled subocular scales arranged in a single row; 7 supralabials to level below center of eye; 4 suboculars broadly in contact with 5 supralabials; ear opening 0.6 x 1.1 mm (length x height); mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 postmentals, outer ones about three times larger than median ones; 8 (right)–6 (left) infralabials to level below center of eye; sublabials moderately enlarged; keeled granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; gorgetal scales more or less arranged in rows, central and anterior gorgetal scales smaller and narrower spaced than those on posterior portion of dewlap; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.60 x 0.45 mm (length x width); about 34 medial dorsal scales in one head length; about 54 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.45 x 0.30 mm (length x width); ventrals at midbody weakly keeled, flat, subimbricate, about 0.60 x 0.70 mm (length x width); about 36 medial ventral scales in one head length; about 60 medial ventral scales between levels of axilla and groin; 101 scales around midbody; except for ventral surface at base of tail, all caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.5 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 40 (right)–41 (left) lamellae under phalanges II–IV of Toe IV of hind limbs; 6 scales under distal phalanx of Toe IV of hind limbs.

Coloration after 16 years preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Olive-Brown (278); dorsal and lateral surfaces of body and limbs Sepia (279); dorsal and lateral surfaces of tail Dark Neutral Gray (299) grading into Cinnamon-Drab (50) distally; ventral surface of head Pale Buff (1) with suffusions of Antique Brown (24); ventral surfaces of body and limbs Cinnamon-Drab (50); ventral surface of tail Cinnamon-Drab (50) with a suffusion of Pearl Gray (262) on central portion.

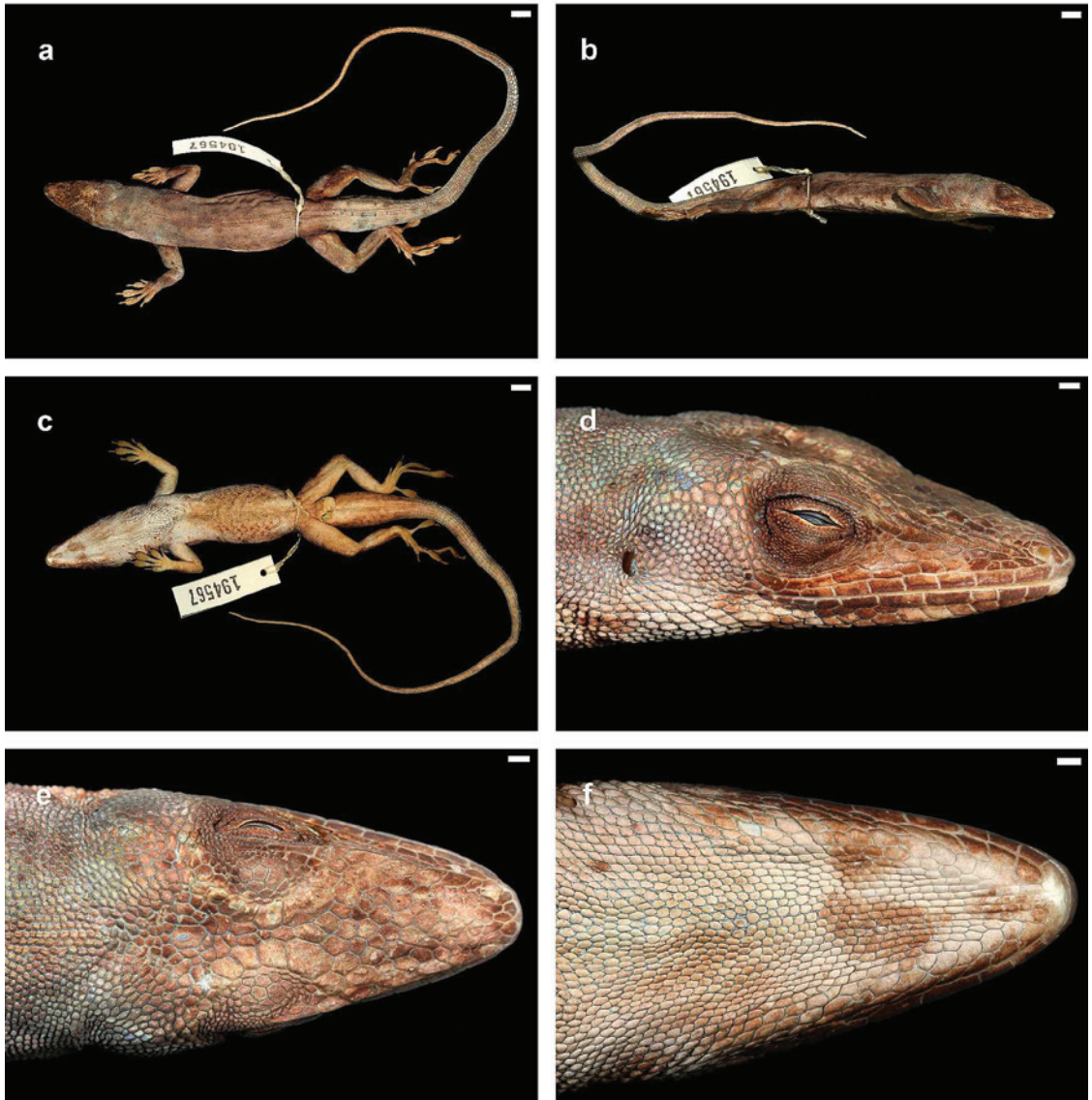


Figure 52. Holotype of *Anolis leucodera* sp. nov. (SMF 97845). (a) dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

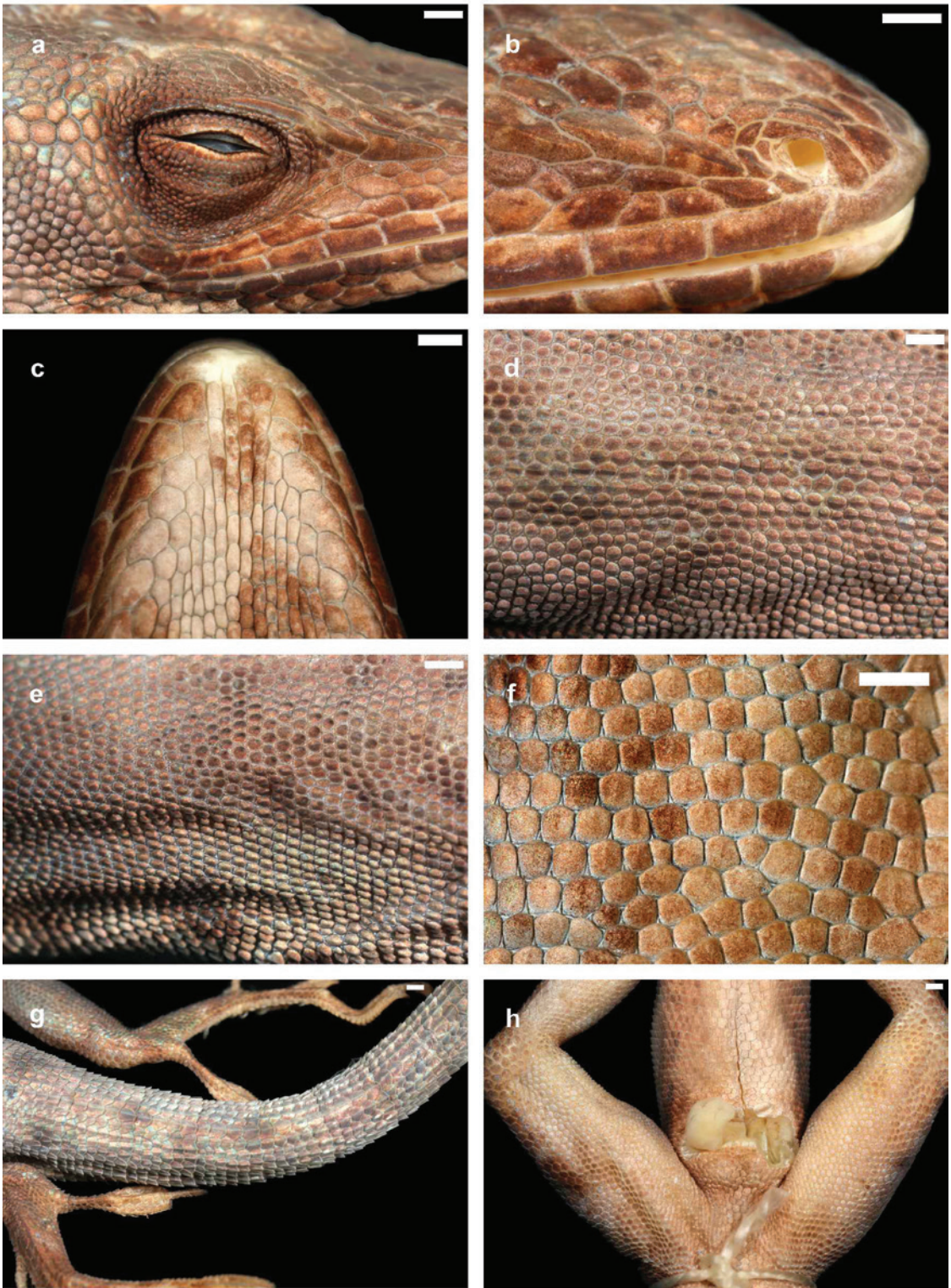


Figure 53. Holotype of *Anolis leucodera* sp. nov. (SMF 97845). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) proximal portion of tail (lateral view); (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

Variation. The paratypes agree well with the holotype in general appearance; morphometrics and scalation (see Table I). In particular, they all lack a suffusion of black pigment in the gular region and all have faintly to weakly keeled ventral scales at midventer.

Etymology. The name *leucodera* is a composite noun in apposition derived from *leukos* (Greek for “white”) and *dere* (Greek for “neck, throat”) referring to the absence of black pigment on the dewlap typical for this species.

Geographic distribution. As currently known, *Anolis leucodera* is restricted to the vicinity of the type locality in northwestern Haiti from near sea level to about 490 masl (Fig. 54).

Natural history notes. Specimens collected by SBH and assistants were taken in mesic vegetation near fresh water, although specific microhabitats were not noted. The northwestern portion of Haiti is otherwise a relatively dry region that has essentially no original vegetation remaining because of deforestation. Although species like this anole appear to be locally common around these sources of water, their total area of occupancy is probably very small. Henderson and Powell (2009) provided a summary of the natural history of “*Anolis chlorocyanus*” which under our concept is represented by four species (i.e., *A. chlorocyanus*, *A. cyanostictus*, *A. leucodera*, and *A. peynadoi*). For a habitat image see Fig. 49.

Conservation. Given its presumably small geographic range and area of occupancy, highly degraded and fragmented habitats, and continuing threat of deforestation, we consider the conservation status of *A. leucodera* to be Critically Endangered based on criterion B1ab(iii) of the IUCN Red List Categories and Criteria (IUCN, 2012).



Figure 54. Habitat of *Anolis leucodera* sp. nov. in a ravine near Rivière Côtes de Fer (19.86173 -73.26586, 30 m), Département Dept. du Nord'Ouest, Haiti. Photo by S.B.H. on 26 April 1997.

TAXONOMY OF THE ANOLES IN THE *ANOLIS ALINIGER* SPECIES GROUP

The species of anoles related to *Anolis aliniger* are readily differentiated from all other Hispaniolan congeners by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows; and (7) a relatively short tail (ratio tail length/SVL <1.7).

The analysis of our molecular data reveal six distinct genetic clusters (Fig. 6). We take this high level of genetic differentiation between these six genetic clusters as evidence for lack of gene flow and in conclusion recognize these six clusters as species level units. In external morphology, these six genetic clusters are more conservative and not easily differentiated (Table I). However, subtle differences between most of these clusters are evident supporting the recognition of each of these as a distinct species, and some of the species exhibit even unique color patterns that are diagnostic. One of these clusters contains specimens from the general area of the type locality of *A. aliniger* (i.e., Cordillera Central of the northern island in the Dominican Republic); thus, this is the valid name for this species. According to our molecular data, five species of *aliniger*-like anoles occur along the western portion of the South Island of Hispaniola (i.e., in the Sierras de Bahoruco, Neiba, and La Selle, respectively), one of which we consider to be conspecific with North Island population of *A. aliniger*. Another species is from Île de la Gonâve, Haiti. For 30 years SBH has collected on and off in the general region of the type locality of *A. singularis* (Massif de la Hotte in western Haiti) but never encountered it. However, given the geographic distance among to the *aliniger*-like species and the remarkable diversity of the latter group on a small geographic scale, we early on suspected true *A. singularis* from Massif de la Hotte to be distinct from the various species we have documented to the east and this was confirmed by the several subtle but constant morphological differences between these species (see respective species accounts for details). No names are available for the *aliniger*-like species from the Sierras de Bahoruco, Neiba, and La Selle as well as for the one from Île de la Gonâve, Haiti, and therefore we describe each of them as a new species below.

TAXONOMÍA DE LOS *ANOLIS* EN EL GRUPO DE ESPECIES *ANOLIS ALINIGER*

Las especies de *Anolis* relacionadas con *Anolis aliniger* se diferencian fácilmente de todos los demás congéneres de la Hispaniola por la combinación de tener (1) coloración en vida en general verde (capaz de cambios rápidos de color a marrón); (2) sin raya subocular blanca y sin raya blanca hacia los laterales del cuello; (3) patas posteriores relativamente cortas (el cuarto dedo de la pata posterior extendido a lo largo del cuerpo alcanza solo hasta la abertura del oído o ligeramente mas allá; (4) las escamas ventrales en la parte media del cuerpo lisas; (5) <38 lamelas subdigitales en las Falanges II – IV del IV dedo de las patas posteriores; (6) saco gular de los machos verde amarillento o marrón (después de la metacrosis) en vida, con hileras sencillas longitudinales de escamas gorgetales o las gorgetales no arregladas en filas; y (7) una cola relativamente corta (proporción longitud de la cola/LHC <1.7).

El análisis de nuestros datos moleculares revelan seis agrupamientos genéticos distintivos (Fig. 6). Consideramos este alto nivel de diferenciación genética entre estos seis agrupamientos genéticos como evidencia de falta de flujo genético y en conclusión reconocemos estos seis agrupamientos genéticos como unidades a nivel de especies. En relación a su morfología

externa, estos seis agrupamientos genéticos son más conservadores y no siempre se diferencian con facilidad (Tabla I). Sin embargo, ligeras diferencias entre la mayoría de estos agrupamientos son evidentes, apoyando el reconocimiento de cada uno de estos como una especie distinta y algunas de las especies exhiben además patrones únicos de coloración que son diagnósticos.

Uno de estos agrupamientos contiene especímenes del área general de la localidad tipo de *A. aliniger* (por ejemplo, La Cordillera Central en la isla del norte en la República Dominicana); por tanto, este es el nombre válido para esta especie. De acuerdo a nuestros datos moleculares, cinco especies de *Anolis* similares a *aliniger* ocurren a lo largo de la porción occidental de la Isla Sur de la Hispaniola (por ejemplo, en las sierras de Bahoruco, Neiba y La Selle, respectivamente), una de las cuales consideramos conespecífica con las poblaciones de la Isla Norte de *Anolis aliniger*.

Otra especie es de la Île de la Gonâve, Haití. Por 30 años SBH ha colectado una y otra vez en la región general de la localidad tipo de *A. singularis* (Massif de la Hotte en el occidente de Haití pero nunca lo ha encontrado. Sin embargo, dada la distancia geográfica entre las especies similares a *aliniger* y la notable diversidad de este último grupo en una escala geográfica pequeña, desde el inicio sospechamos que los verdaderos *A. singularis* del Massif de la Hotte eran distintos de las diversas especies que hemos documentado hacia el este y esto fue confirmado por las varias diferencias morfológicas ligeras pero constantes entre estas especies (ver los reportes de especies para los detalles). No hay disponibles nombres para las especies similares a *aliniger* de las sierras de Bahoruco, Neiba y La Selle así como tampoco para una de la Île de la Gonâve, Haití, y por lo tanto describimos cada una de ellas como una nueva especie más abajo.

Anolis aliniger Mertens, 1939
Figs. 55–58

Anolis chlorocyanus aliniger Mertens, 1939: 66; type locality: “Unterhalb von Paso Bajito, etwa 900 m H.”. Holotype: SMF 25825.

Anolis aliniger: Schwartz & Thomas, 1975 (in part.); Williams, 1976 (in part.); Schwartz *et al.*, 1978 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Powell, 2002 (in part.); Henderson & Powell, 2009 (in part.).

Diagnosis. A moderate-sized species of *Anolis* that differs from all other Hispaniolan congeners except *A. singularis* and the species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. aliniger* is most similar to *A. singularis* and the species described below. *Anolis aliniger* differs from *A. singularis* by (1) usually having a black axillary blotch (vs. such a blotch absent in *A. singularis*); (2) having a deep axillary pocket which is usually scale-less (vs. no scale-less axillary pocket in *A. singularis*); (3) sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent

to this row); (4) median dorsal scales slightly enlarged, less than twice the size of adjacent scales (vs. at least twice the size of adjacent scales in *A. singularis*). For differences between *A. aliniger* and the species described below, see the respective accounts of the new species.

Description. *Anolis aliniger* is a moderate-sized anole (maximum recorded SVL 58.0 mm in males, 52.0 in females); dorsal head scales in internasal region smooth or rugose; other dorsal head scales smooth, rugose, or weakly keeled; 4 to 7 postrostrals; 5 to 7 scales between nasals; one elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in shallow to moderate prefrontal depression smooth, rugose, or weakly keeled; supraorbital semicircles well developed, separated medially usually by 1, occasionally by 0 or 2 scale rows at narrowest point; supraorbital disc composed of 3 to 5 slightly to moderately enlarged, smooth to faintly keeled scales arranged in 3 to 4 rows; circumorbital row complete or incomplete; a single elongated superciliary, followed posteriorly by small, smooth, granular scales; 2 to 3 rows of small weakly keeled scales extending between enlarged supraorbitals and superciliary; an ill-defined to moderate parietal depression present; interparietal scale well developed, slightly smaller to distinctly larger than ear opening, surrounded by scales of moderate size; 1 to 4 scales present between interparietal and supraorbital semicircles; 6 to 10 scales present between second canthals; 8 to 11 scales present between posterior canthals; 11 to 29 mostly smooth, some keeled loreal scales in a maximum of 3 to 5 horizontal rows; 4 to 5 weakly keeled subocular scales arranged in a single row; 5 to 8 supralabials to level below center of eye; 3 to 6 suboculars broadly in contact with 3 to 6 supralabials; mental distinctly wider than long, partly divided medially, bordered posteriorly by 5 to 8 postmentals, outer ones two to three times the size of adjacent median ones; 5 to 9 infralabials to level below center of eye; sublabials not or only moderately enlarged (< four times the size of medial postmental scales); scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; 34 to 70 medial dorsal scales in one head length; 55 to 86 medial dorsal scales between levels of axilla and groin; lateral scales smooth, granular and more or less homogeneous in size; ventrals at midbody smooth, flat, subimbricate; 30 to 48 medial ventral scales in one head length; 45 to 68 medial ventral scales between levels of axilla and groin; 108 to 142 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, ratio postcloacal scale width/SVL 0.019–0.032; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth or weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh smooth or weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad about 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 30 to 37 lamellae under phalanges II–IV of Toe IV of hind limbs; 7 to 8 scales under distal phalanx of Toe IV of hind limbs. For variation in selected scalation and morphometric characters see Table I.

The completely everted hemipenis (KU 250323) is a small, unilobed organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; an asulcate ridge present; no surface ornamentation discernible. The completely everted hemipenis of MCZ R-189491 and SMF 98129 (Fig. 58) agree in morphology with KU 250323.

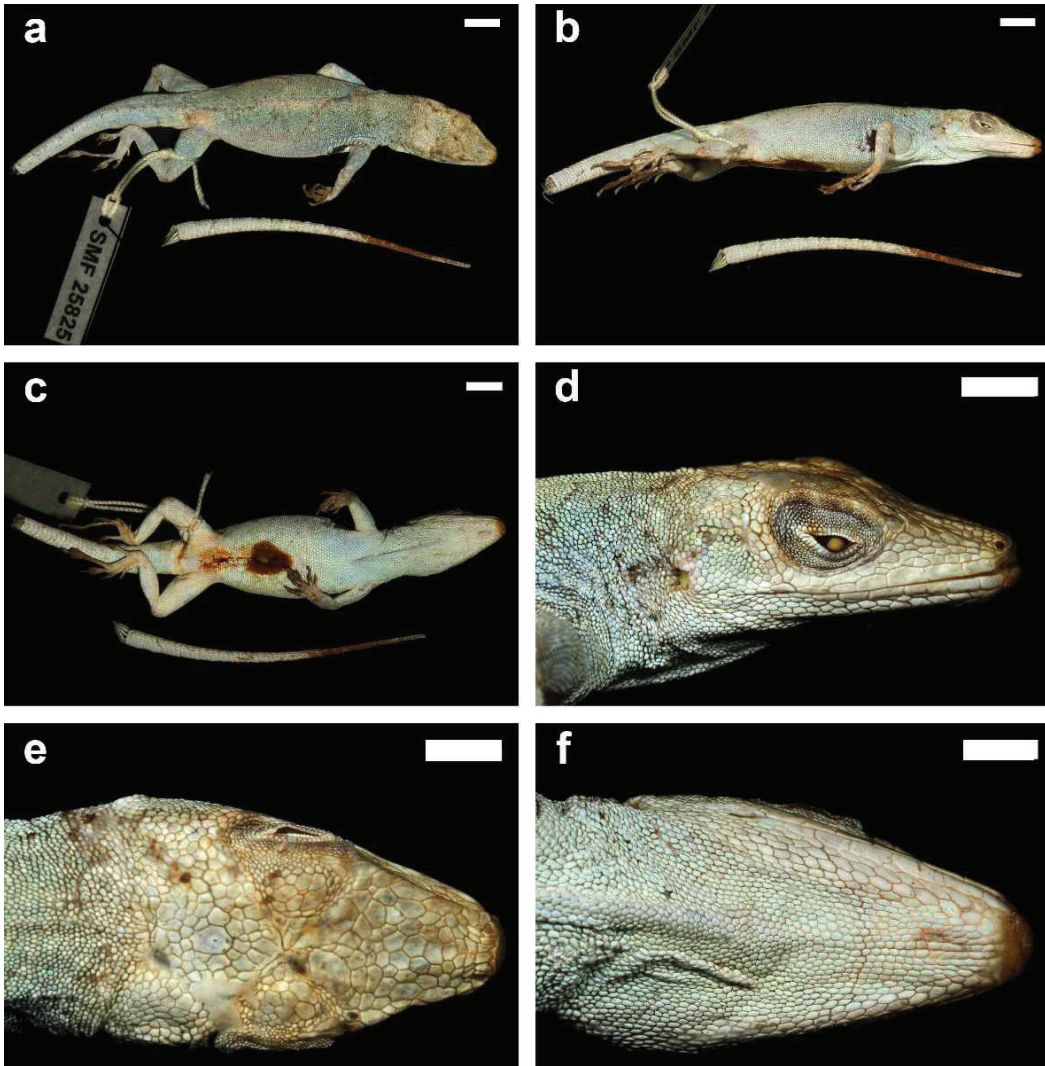


Figure 55. Holotype of *Anolis aliniger* (SMF 25825). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

Geographic distribution. As currently known, *Anolis aliniger* is distributed in the central mountains of the Dominican Republic and adjacent mountains in Haiti from about 900 to about 1680 masl (Fig. 59).

Natural history notes. *Anolis aliniger* is an uncommon lizard where it occurs. SBH has encountered the species only rarely, and always sleeping at night. At night GK encountered one individual sleeping on a twig, about 8 m above the ground (see Fig. 60 for habitat image). A summary of the natural history of this species can be found in Henderson and Powell (2009).

Conservation. Given its presumably large geographic range and somewhat reduced threat from deforestation in the protected areas of the Dominican Republic, we consider the conservation status of *Anolis aliniger* to be Least Concern based on the IUCN Red List Categories and Criteria (IUCN, 2012).

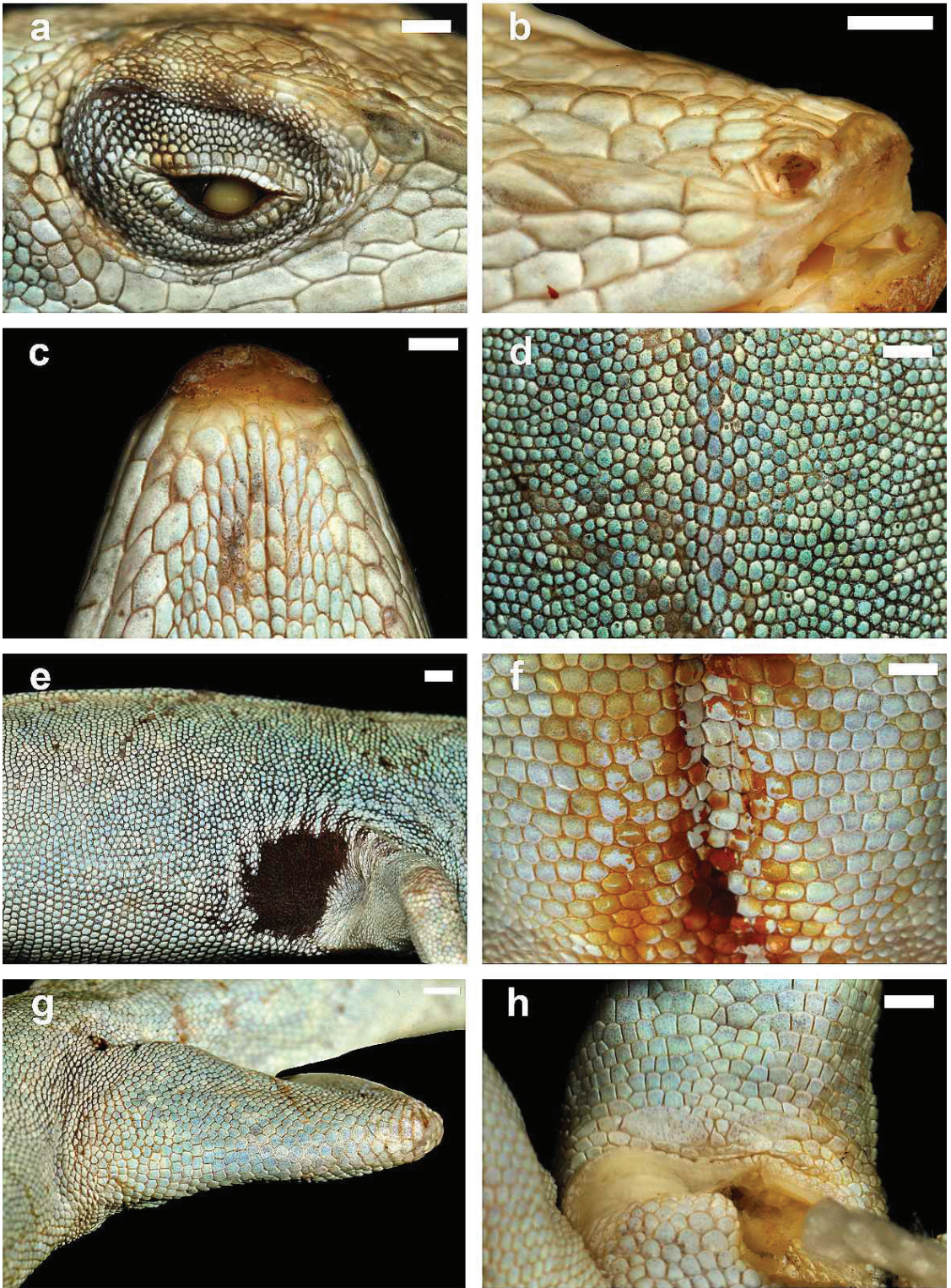


Figure 56. Holotype of *Anolis aliniger* (SMF 25825). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

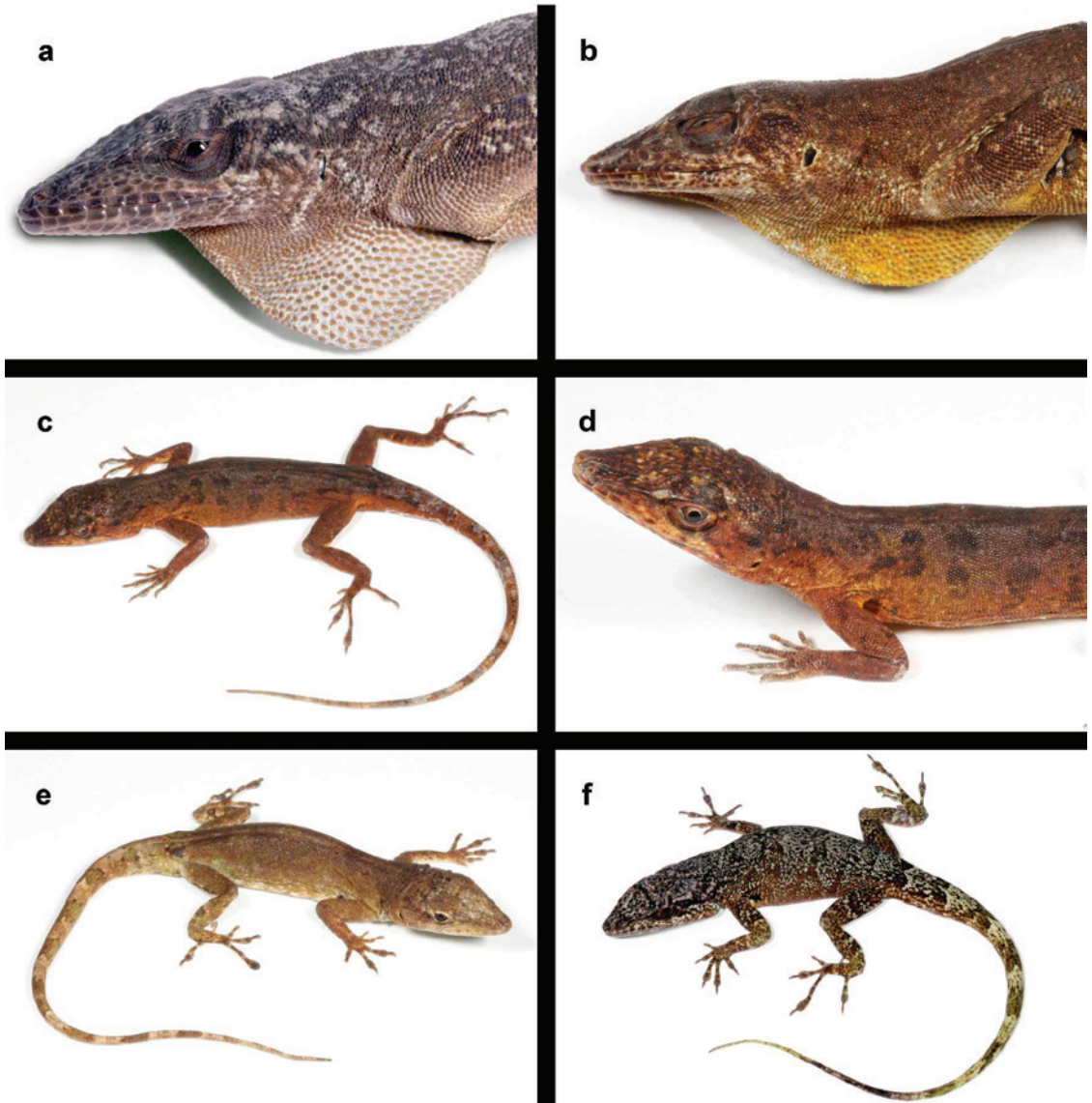


Figure 57. *Anolis aliniger* in life (all males). (a) SMF 98129; (b) SMF 98131; (c) SMF 98132; (d) SMF 98132; (e) USNM 558683; (f) SMF 98129. Photos by S.B.H.

Specimens examined. Dominican Republic. Bahoruco: Apolinar Perdomo: 900 m: SMF 98130 (KJ566830); El Aguacate (La Venta): MCZ R-171752–54, 171759; Dajabon: 12 km S Loma de Cabrera: KU 250259–60; Elias Pina: 15 km SE intersection Río Limpio –Restauración road: KU 250264; 6.7 mi E Hondo Valle: KU 250262–63; Espaillat: 15 km N Moca: MCZ R-143366; 5 km N Puesto Grande: MCZ R-128201; Independencia: Los Pinos: KU 250261; La Vega: 1 mi S Constanza: KU 250324; 1.9 km S Constanza, on road to San José de Ocoa, then W on side road to Hotel Nueva Suiza: USNM 314268–70; 10 km W Jarabacoa on road to La Quebrada: MCZ R-143363–64; 2 km N El Río: KU 315812; 2 km WSW La Palma: KU 315813–14; 5.1 mi N Constanza: KU 250328–29; Balneario Río Grande, 2.5 km S Constanza, 1190 m: MCZ R-143365; Constanza: KU 250265–66, MCZ R-152340–41, SMF 81390–91; Constanza, behind Hotel Nueva Suiza: MCZ R-115657; Constanza, near Hotel Nueva Suiza, 1150 m: MCZ R-143372, 143374–75; El Río: AMNH 44852; La Palma: MCZ R-107012; La Palma, 12 km E El Río: KU 250323; La Palma, 14 km E El Río: KU 250269; La Palsa: MCZ R-128205; Moremor Novel, near Constanza: MCZ R-56915; Paso Bajito: SMF 25825; Reserva Ébano Verde, La Palma Research Station: MCZ R-186718; Río Constanza (village), ca. 17.6 km (by road) E Constanza (measured from turnoff to San José de Ocoa), on road to Autopista Duarte, Río Rancho Quemao: USNM 314274–76; road from Constanza to Autopista Duarte, 1 km W Las Palmas: KU 315818–20; Monseñor Nouel: Cano de Vaca on road from Bonao to El Río: MCZ R-107013. Pedernales: near Haiti border: MCZ R-189491; Peravia: 1st. bridge S San José de Ocoa: MCZ R-128202; San Juan: 10 km N El Cercado: KU 250332; 4.9 mi NW Vallejuelo: KU 250333–34; 6.1 mi S Las Matas de Farfan: KU 250335–36; 7 km N Carpinetero: MCZ R-57463; Batista (near Derrumbadero): 3000 ft: MCZ R-171700; Santiago: Río Bao, 3.4 mi SE Los Montones: KU 250337–39; Valle de Bao, 1650 m: SMF 98129 (KJ566827, EF531485), USNM 558680 (KJ566828), USNM 558681 (KJ566829, EF531486). Haiti: Artibonite: ca. 2 km W of junction of North road and road to Marmelade on road to Marmelade: MCZ R-153398; Morne Basile, 1424 m: SMF 98131 (KJ566852), USNM 558682; Ouest: La Visite National Park: MCZ R-190696; Sud’Est: Morne D’Enfer, 1433 m: SMF 98132 (KJ566853), USNM 558683; Seguin: KU 216100.

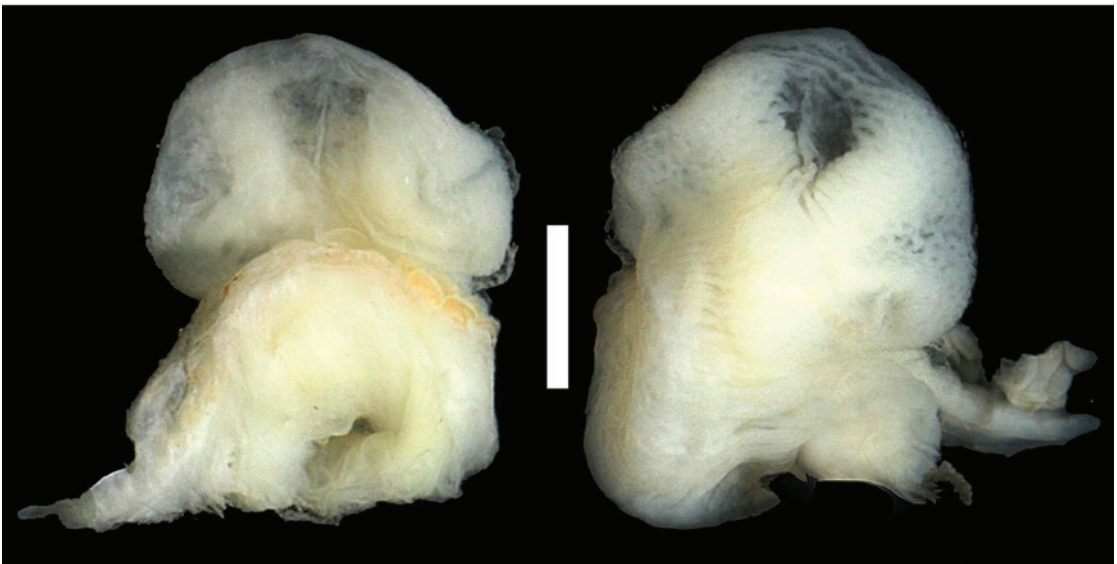


Figure 58. Hemipenis of *Anolis aliniger* (SMF 98129). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

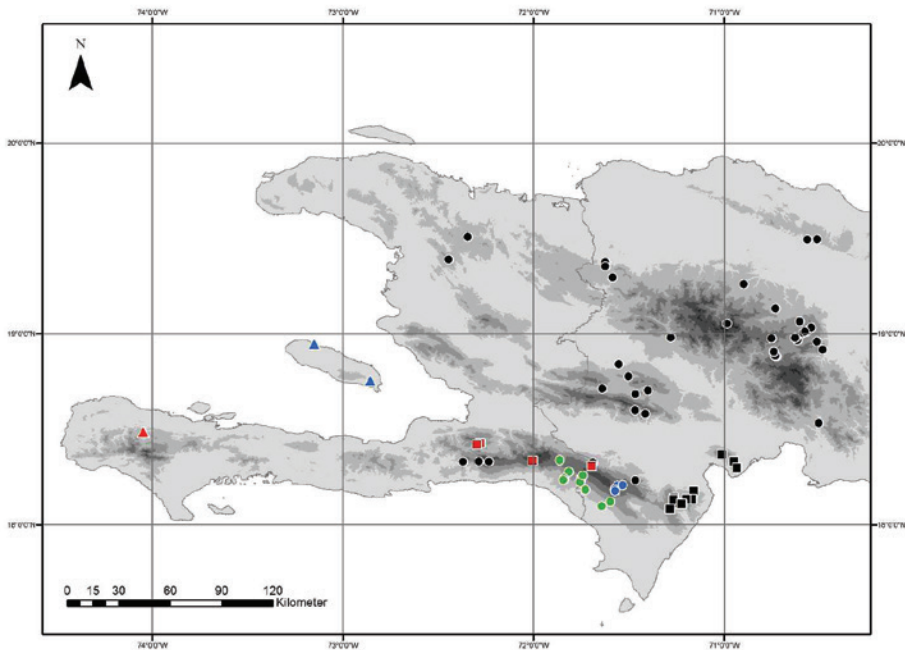


Figure 59. Map indicating collecting localities of the species in the *Anolis aliniger* species group. Each symbol can represent one or more adjacent localities. Areas above 500 and 1000 m are shaded medium dark and dark gray, respectively. Black circles: *Anolis aliniger*; green circles: *A. eladioi* sp. nov.; blue circles: *A. divius* sp. nov.; black squares: *A. prasinorius* sp. nov.; red squares: *A. apulepis* sp. nov.; blue triangles: *A. gonavensis* sp. nov.; red triangle: *A. singularis*.



Figure 60. Habitat of *Anolis aliniger* Reserva Científica Ébano Verde (19,03267, -70,54327, 1070 m), Vega Province, Dominican Republic. Photo by G.K. on 2 November 2013.

Anolis singularis Williams, 1965
Figs. 61–62

Anolis singularis Williams, 1965: 9; type locality: “Pourcine, Massif de la Hotte, Haiti”. Holotype: MCZ 72043. Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Henderson & Powell, 2009 (in part.).

Diagnosis. A moderate-sized species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger* and the species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. singularis* is most similar to *A. aliniger* and the species described below. *Anolis singularis* differs from *A. aliniger* by (1) the lack of a black axillary blotch (vs. such a blotch usually present in *A. aliniger*); (2) having the sublabial scales about the same size as scales medially adjacent to this row (vs. sublabial scales much larger than median scales adjacent to them in *A. aliniger*). For differences between *A. singularis* and the species described below, see the respective accounts of the new species.

Description of the holotype. Adult male, as indicated by the presence of a pair of greatly enlarged postloocal scales; SVL 40.0 mm; tail length 50.0 mm (complete); tail slightly compressed in cross section, tail height 2.3 mm and width 2.1 mm; axilla to groin distance 15.9 mm; head length 12.7 mm, head length/SVL ratio 0.32; snout length 6.4 mm; head width 6.9 mm; shank length 8.3 mm, shank length/head length ratio 0.65. Dorsal head scales in internasal region smooth or keeled, unicarinate; other dorsal head scales smooth or rugose; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in shallow prefrontal depression mostly smooth; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 4 moderately enlarged scales arranged in 3 to 4 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, rugose to weakly keeled, granular scales; 2 to 3 rows of small smooth scales extending between enlarged supraorbitals and superciliary; parietal depression ill-defined; interparietal scale well developed, 1.1 x 0.8 mm (length x width), surrounded by 9 scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 large and 2 small anterior canthal scales; 10 scales present between second canthals; 9 scales present between posterior canthals; 17 (right)–17 (left) mostly keeled loreal scales in a maximum of 4 (right)–4 (left) horizontal rows; 5 keeled subocular scales arranged in a single row; 6 supralabials to level below center of eye; 5 (right)–4 (left) suboculars broadly in contact with 5 (right)–4 (left) supralabials; ear opening 0.7 x 0.9 mm (length x height); mental distinctly wider than long, partly divided medially, bordered posteriorly by 7 postmentals, outer ones slightly larger than median ones; 8 infralabials to level below center of eye; sublabials not enlarged; scales in sublabial row about the same size as scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; dewlap more or less evenly covered with large, keeled

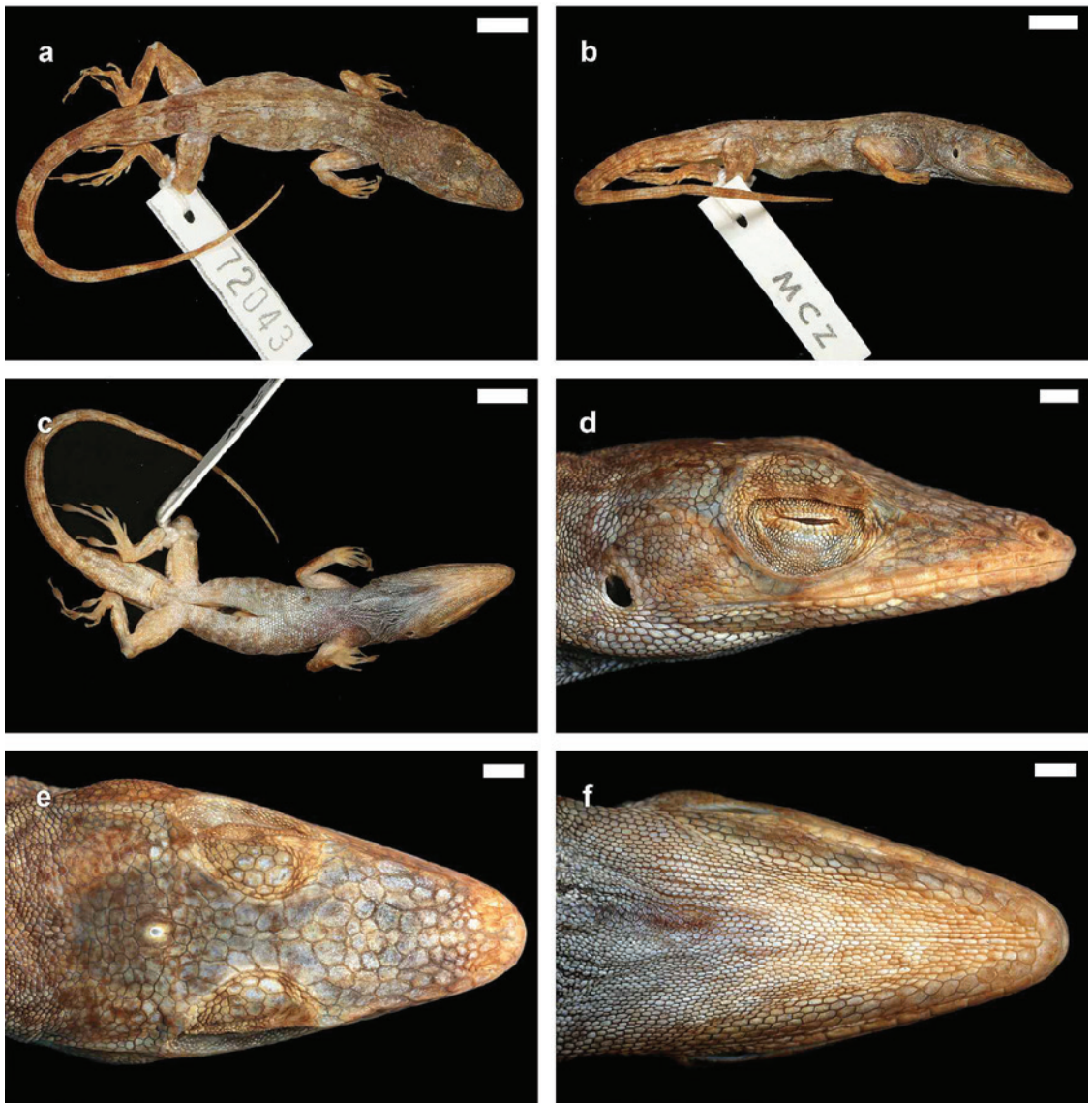


Figure 61. Holotype of *Anolis singularis* (MCZ 72043). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

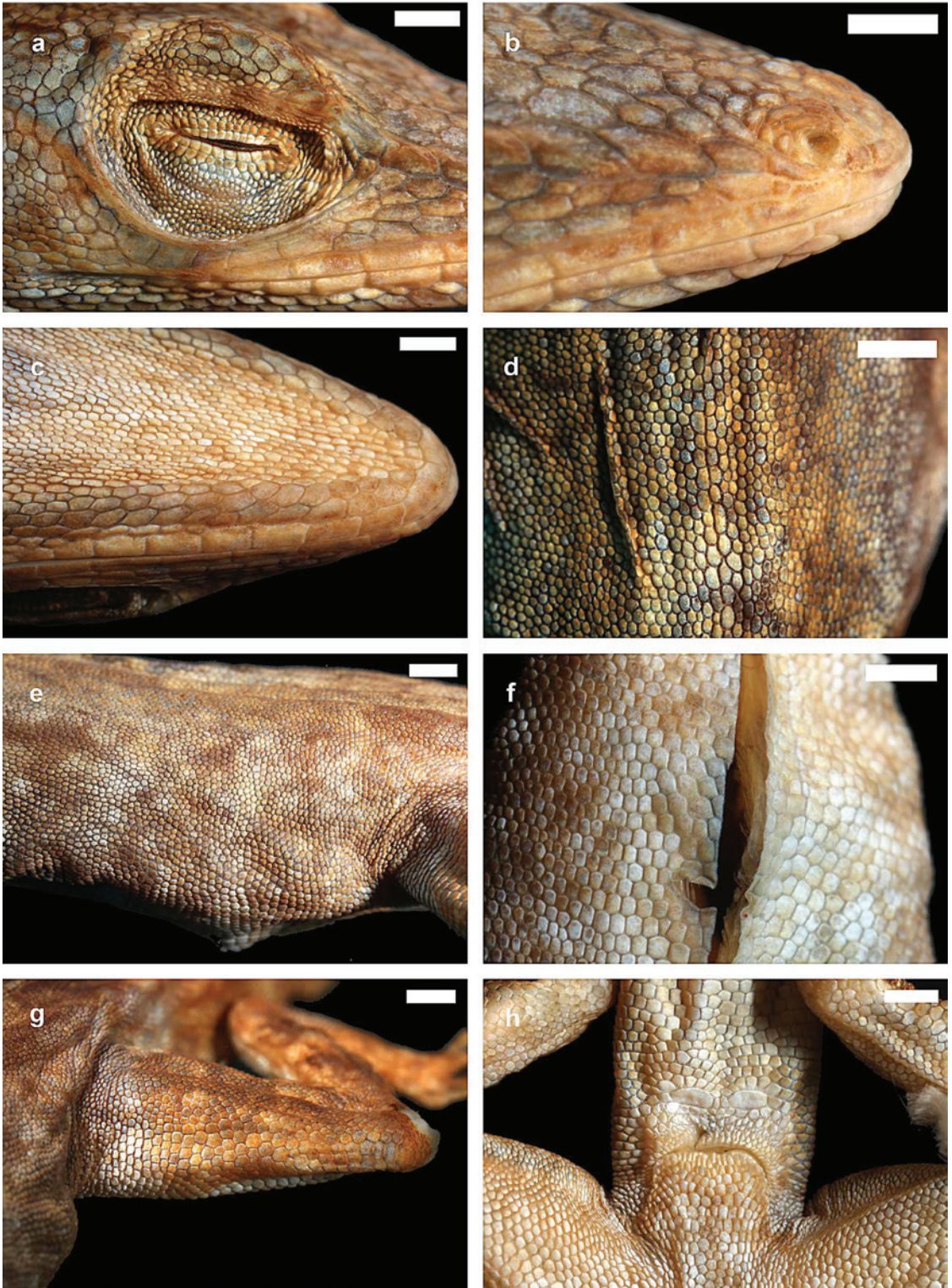


Figure 62. Holotype of *Anolis singularis* (MCZ 72043). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region; (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

gorgetal scales, the posterior ones larger than central and anterior ones; a nuchal crest and a dorsal ridge present; dorsum of body with smooth, juxtaposed scales; 2 medial rows moderately enlarged, about twice the size of adjacent scales; largest dorsal scales about 0.30 x 0.20 mm (length x width); about 58 medial dorsal scales in one head length; about 66 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.13 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.35 x 0.35 mm (length x width); about 46 medial ventral scales in one head length; about 56 medial ventral scales between levels of axilla and groin; 129 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 0.85 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth to weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad about 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 36 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs.

Geographic distribution. *Anolis singularis* is only known from its holotype and thus restricted to the Massif de la Hotte in western Haiti (Fig. 59).

Natural history notes. There are no ecological data associated with the only known specimen of *Anolis singularis*.

Conservation. Given its presumably small geographic range and continuing threat of habitat loss through deforestation, we consider the conservation status of *Anolis singularis* to be Critically Endangered based on criterion B.1.a. of the IUCN Red List Categories and Criteria (IUCN, 2012).

Remarks. There is some mystery surrounding the type locality of *Anolis singularis*, because Pourcine is not locatable on even the most detailed topographic maps of Haiti (1:50,000), and Williams (1965) did not mention any details about the locality, including the elevation, except “Massif de la Hotte.” The locality is georeferenced in the Harvard-MCZ collection at low accuracy as 18.4 N, -74.033 W, covering a large area and wide range of elevations. However there is a community called “Pourcine” not far to the north, near Annette, at 18.484, -74.048 (550 m) that is likely the type locality, not to be confused with another “Pourcine,” near Roseaux, further to the north. The Annette Pourcine is mentioned in a USAID contract report (Bitoun 1979), where the elevation is listed. Also, such low to intermediate elevation is consistent with the presence of the other species of amphibians and reptiles collected at Pourcine by the same collector (Francois Vuilleumier), in December 1962 and February 1963: *Anolis barbouri*, *A. coelestinus*, *Leiocephalus melanochlorus*, *Sphaerodactylus elegans*, and *Osteopilus dominicensis*. Pourcine is reachable by a road from Jérémie and Marché Léon. Surprisingly, a large number of collections of anoline lizards have been made in the intervening 50 years in that region of Haiti, but no additional specimens of the species have been seen or collected, making it probably the rarest species of reptile on the island.

Specimens examined. Haiti. Grand’Anse: Pourcine, Massif de la Hotte: MCZ 72043.

Anolis divius sp. nov.

Figs. 63–66

Holotype. SMF 97970, an adult male, Parque Nacional Sierra de Bahoruco, Canote–El Alcajé road (18.17612, -71.57349), 1810 m, Province Pedernales, Dominican Republic; collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. Field tag number GK-4868.

Paratypes. All from Province Pedernales, Dominican Republic: SMF 97968, Parque Nacional Sierra de Bahoruco, Canote–El Alcajé road (18.18329, -71.57446), 1925 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez; SMF 97969, from Parque Nacional Sierra de Bahoruco, Canote–El Alcajé road (18.18652, -71.57501), 1950 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. SMF 98170 (KJ566847, KJ566901), USNM 558717, Caseta Dos, ca. 22 km N Aceitillar by road (18.20753, -71.53380), 1750 m, collected 25 August 2005 by S. Blair Hedges, M. Heinicke, N. Corona. SMF 98171, ca. 12 km N Aceitillar by road (18.20348, -71.56052), 2045 m, collected 25 August 2005 by Eladio Fernández.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger*, *A. singularis*, and the species described below by the combination of having (1) predominantly blue or green overall coloration in life (capable of rapid color change to brown); (2) 10–18 loreal scales in 2–4 rows (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows, central gorgetal scales about the same size as those on posterior portion of dewlap; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. divius* is most similar to *A. aliniger*, *A. singularis*, and the species described below from which it differs by its predominantly blue coloration of tail and legs—in some male individuals of the whole body—in life (vs. predominately green in life); however, all of these species are capable of rapid metachrosis to brown. *Anolis divius* differs further from *A. aliniger* by usually having fewer than 16 total loreal scales (vs. usually more than 16 in *A. aliniger*) usually lacking a black axillary blotch (vs. such a blotch usually present in *A. aliniger*) and by having a pale blue to grayish blue iris in life (vs. brown to reddish brown in *A. aliniger*). *Anolis divius* differs from *A. singularis* by having the sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent to this row in *A. singularis*) and by its much larger adult size, reaching 68 mm SVL in males and 55 mm SVL in females (vs. only known adult male of *A. singularis* 40 mm SVL). For differences between *A. divius* and the species described below, see the respective accounts of the new species.

Description of the holotype. Adult male, as indicated by everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 68.0 mm; tail length 105.0 mm (complete); tail round in cross section, tail height 4.5 mm and width 4.5 mm; axilla to groin distance 26.0 mm; head length 20.4 mm, head length/SVL ratio 0.30; snout length 9.6 mm; head width 11.1 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 15.3 mm, shank length/head length ratio 0.75; longest finger of extended forelimb reaching to nostril; longest finger of adpressed forelimb reaching to anterior insertion of hind limbs. Dorsal head scales in internasal region smooth or rugose; other dorsal head scales smooth, rugose, or weakly keeled; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in ill-defined prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 5 moderately

enlarged, faintly keeled scales arranged in 3 to 4 rows; circumorbital row incomplete, therefore, one enlarged supraorbital scale on each side in contact with supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, smooth, granular scales; 2 to 3 rows of small smooth scales extending between enlarged supraorbitals and superciliary; a moderate parietal depression present; interparietal scale well developed, 1.8 x 1.2 mm (length x width), surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 5 large and 2 small anterior canthal scales; 7 scales present between second canthals; 9 scales present between posterior canthals; 18 (right)—17 (left) mostly smooth, some keeled loreal scales in a maximum of 3 (right)—4 (left) horizontal rows; 4 to 5 weakly keeled subocular scales arranged in a single row; 7 supralabials to level below center of eye; 3 suboculars broadly in contact with 4 supralabials; ear opening 0.4 x 1.3 mm (length x height); mental distinctly wider than long, partly divided medially, bordered posteriorly by 6 postmentals, outer ones moderately larger than median ones; 8 infralabials to level below center of eye; sublabials not or only moderately enlarged (< four times the size of medial postmental scales); scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; dewlap more or less evenly covered with large, keeled gorgetal scales, the posterior and central ones larger than anterior ones; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.55 x 0.32 mm (length x width); about 42 medial dorsal scales in one head length; about 59 medial dorsal scales between levels of axilla and groin; lateral scales smooth, granular and more or less homogeneous in size, average size 0.30 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.60 x 0.50 mm (length x width); about 40 medial ventral scales in one head length; about 53 medial ventral scales between levels of axilla and groin; 136 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 2.3 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth or weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh smooth or weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad about 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 36 (right)—37 (left) lamellae under phalanges II—IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs.

The completely everted hemipenis (SMF 97970, Fig. 65) is a slightly bilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; a weak asulcate ridge present, no asulcate processus; apex calyculate, truncus and asulcate ridge with transverse folds.

The coloration in life immediately after catching was recorded as follows: Dorsal surface of head Sepia (279); dorsal and lateral surfaces of body and legs Fawn Color (258) with Sepia (279) blotches; dorsal surface of tail Medium Fawn Color (257) grading into Pratt's Payne's Gray (293) on middle portion, distal portion Dusky Brown (285), tip Tawny Olive (17) with Brussels Brown (33) speckles; ventral surface of head Greenish Glauous (271) with Olive—Brown (278) streaks; ventral surface of body Greenish Glauous (271), suffused with Clay Color (20); ventral surfaces of legs and base of tail Clay Color (20); dewlap Light Cyan (159), some gorgetals Olive—Brown (278). In its blue phase, the coloration in life was recorded as follows: Dorsal surface of head Smoke Gray (267); lateral surface of head Pearl Gray (262) with suffusions of Pale Emerald Green (141); a Dark Venetian Blue (171) ring around eye; dorsal and lateral surfaces of body Light Neutral Gray (297) suffused with Parrot Green (121) on posterior

body and with Dark Neutral Gray (299) blotches on dorsum, most of them edged posteriorly by Light Sky Blue (191); dorsal surface of anterior two-thirds of tail Light Caribbean Blue (163) with indistinct Medium Blue (169) bands; distal portion Dusky Brown (285), tip Olive Horn Color (16); ventral surface of head Smoky White (261), heavily suffused with Pale Cyan (157); ventral surface of body, legs, and base of tail Pale Greenish Yellow (86); ventral surface of tail otherwise Pale Cyan (157), except distal portion and tip which are colored as dorsally; dewlap Light Caribbean Blue (163); iris Warm Sepia (40) with a Deep Water Blue (181) inner ring.

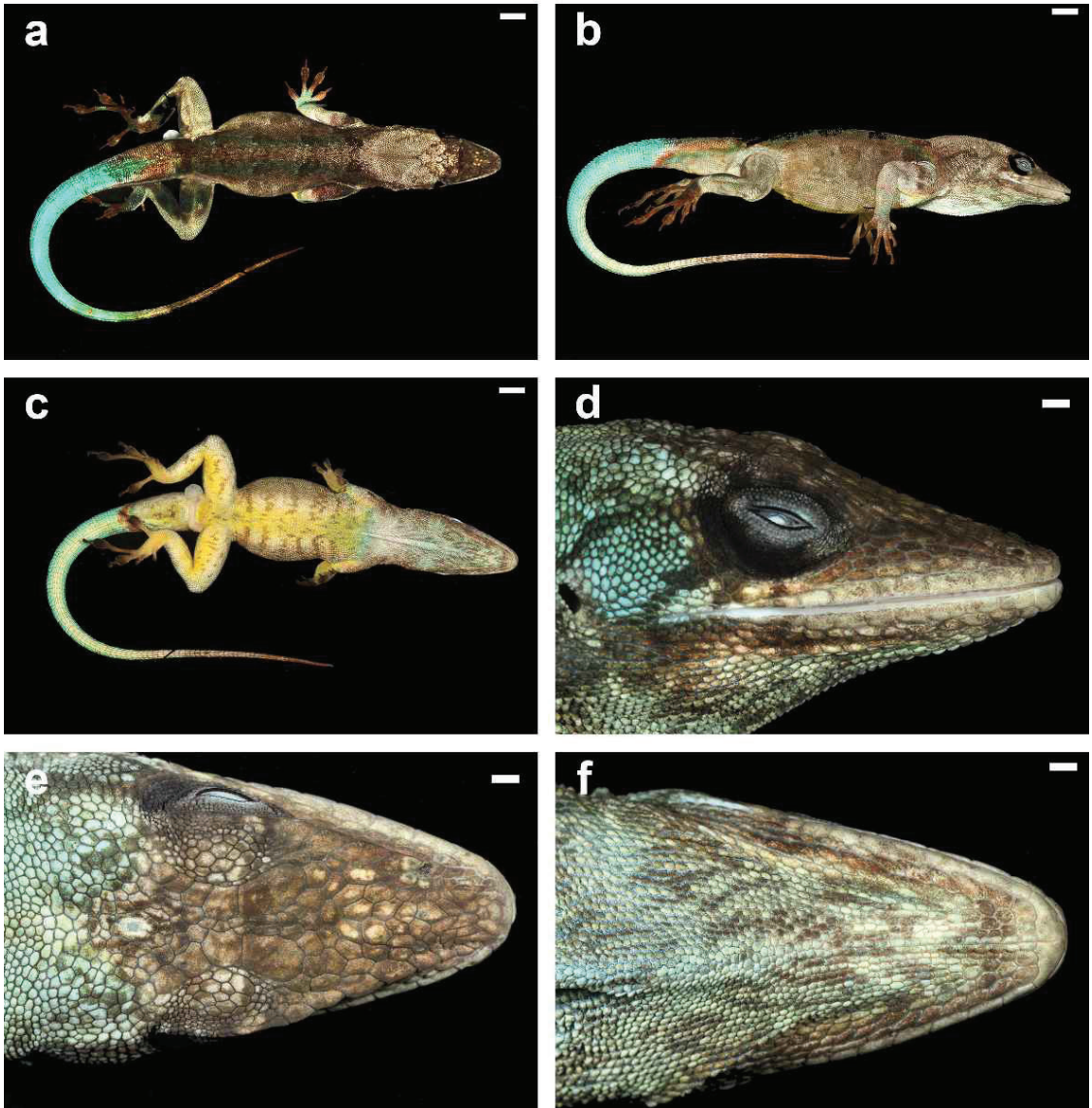


Figure 63. Holotype of *Anolis divius* sp. nov. (SMF 97970). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

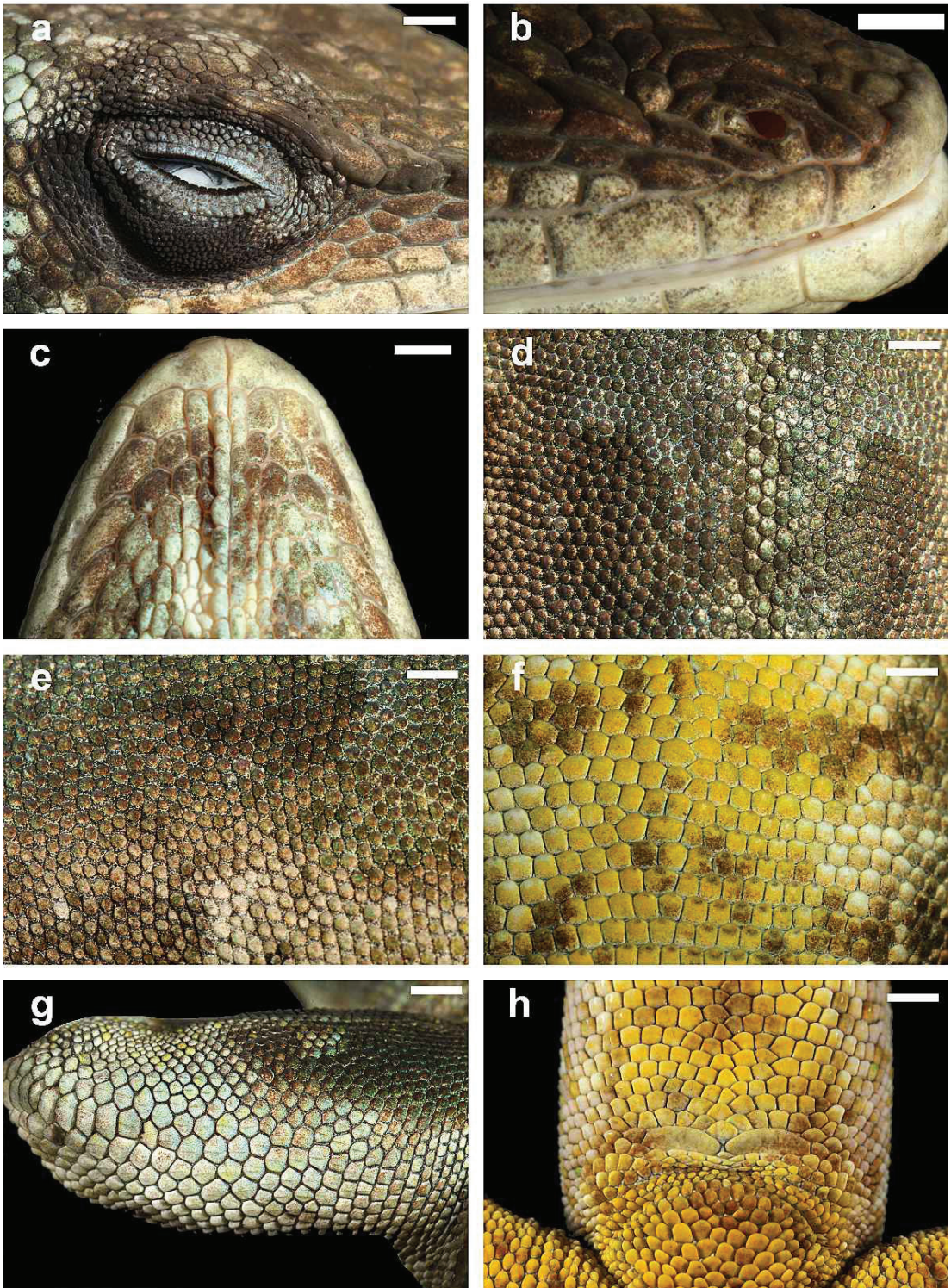


Figure 64. Holotype of *Anolis divius* sp. nov. (SMF 97970). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

Coloration after six months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Fuscous (283); dorsal and lateral surfaces of neck Dark Pearl Gray (290); dorsal and lateral surfaces of body Dusky Brown (285); dorsal and lateral surfaces of forelimbs Pratt's Payne's Gray (293) with suffusions of Dusky Brown (285); dorsal and lateral surfaces of hind limbs Glaucous (289); dorsal and lateral surfaces of tail Medium Blue Gray (193) with indistinct Dark Blue Gray (194) bands; ventral surface of head Light Sky Blue (191) grading into Sky Blue (192) posteriorly and with Dark Neutral Gray (299) streaks and suffusions; ventral surface of body Olive Horn Color (16) grading into Light Straw Yellow (95) on posterior portion and with Olive-Brown (278) bands; ventral surfaces of forelimbs Sulphur Yellow (91); ventral surfaces of hind limbs Sulphur Yellow (91) with Olive-Brown (278) mottling; ventral surface of base of tail Cream White (52) with a suffusion of Olive-Brown (278); ventral surface of central portion of tail Light Cyan (158), distal portion Dusky Brown (285).

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table I). All but one specimen (USNM 558717) lack a black axillary blotch. In two adult females (SMF 97968–69) the longest toe of adpressed hind leg reaching to a point between ear opening and eye. Dewlap size is 32 and 101 mm², respectively, in two females (SMF 97965, 97968).

The coloration in life of an adult female (SMF 97969; Fig. 66e, f) was recorded as follows: Dorsal surface of Fawn Color (258); dorsal and lateral surfaces of body Medium Fawn Color (257) with Olive–Brown (278) blotches and with a suffusion of Grayish Horn Color (268) along dorsolateral region; dorsal surface of tail Light Emerald Green (142) with Pale Neutral Gray (296) transverse bands; ventral surfaces of body, legs, and tail Antique Brown (24) with Warm Sepia (40) transverse bands; regenerated portion of tail Smoke Gray (267) ventrally and Grayish Horn Color (268) dorsally; dewlap Raw Sienna (32); iris Warm Sepia (40) with a Deep Water Blue (181) inner ring.

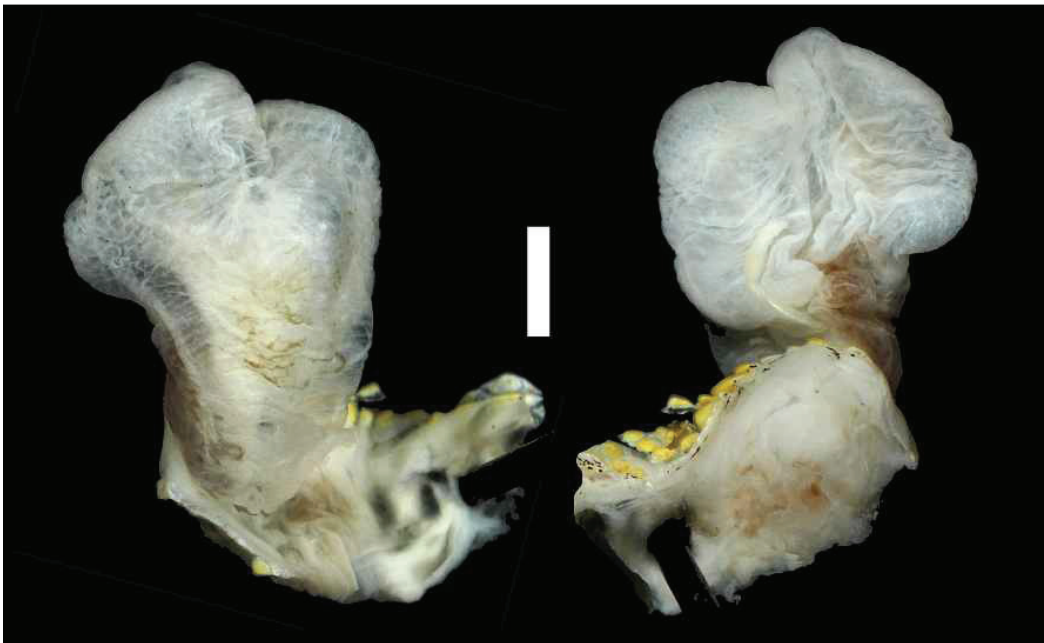


Figure 65. Hemipenis of *Anolis divius* sp. nov. (SMF 97970). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.

Etymology. The name *divius* is the neuter singular nominative comparative of *divus* (Latin for “divine”, “heavenly”, and refers to the “sky god”), in allusion to the blue coloration of this species.

Geographic distribution. As currently known, *Anolis divius* is restricted to the pine forests of the high plateau in the Sierra de Bahoruco from 1750 to 2040 masl (Fig. 59).

Natural history notes. *Anolis divius* inhabits the open pine forest at high elevations in the Sierra de Bahoruco. Several individuals were seen hiding between the spiny leaves of large agave next to big pine trees at day time (Figs. 66f). Others were spotted on trunks of pine trees at 2 to 10 m above ground level. When approached, they escaped by rapidly climbing up the tree.

Conservation. Given its small geographic range and continuing threat from deforestation, we consider the conservation status of *Anolis divius* to be Endangered based on criterion B1ab (iii) of the IUCN Red List Categories and Criteria (IUCN, 2012).

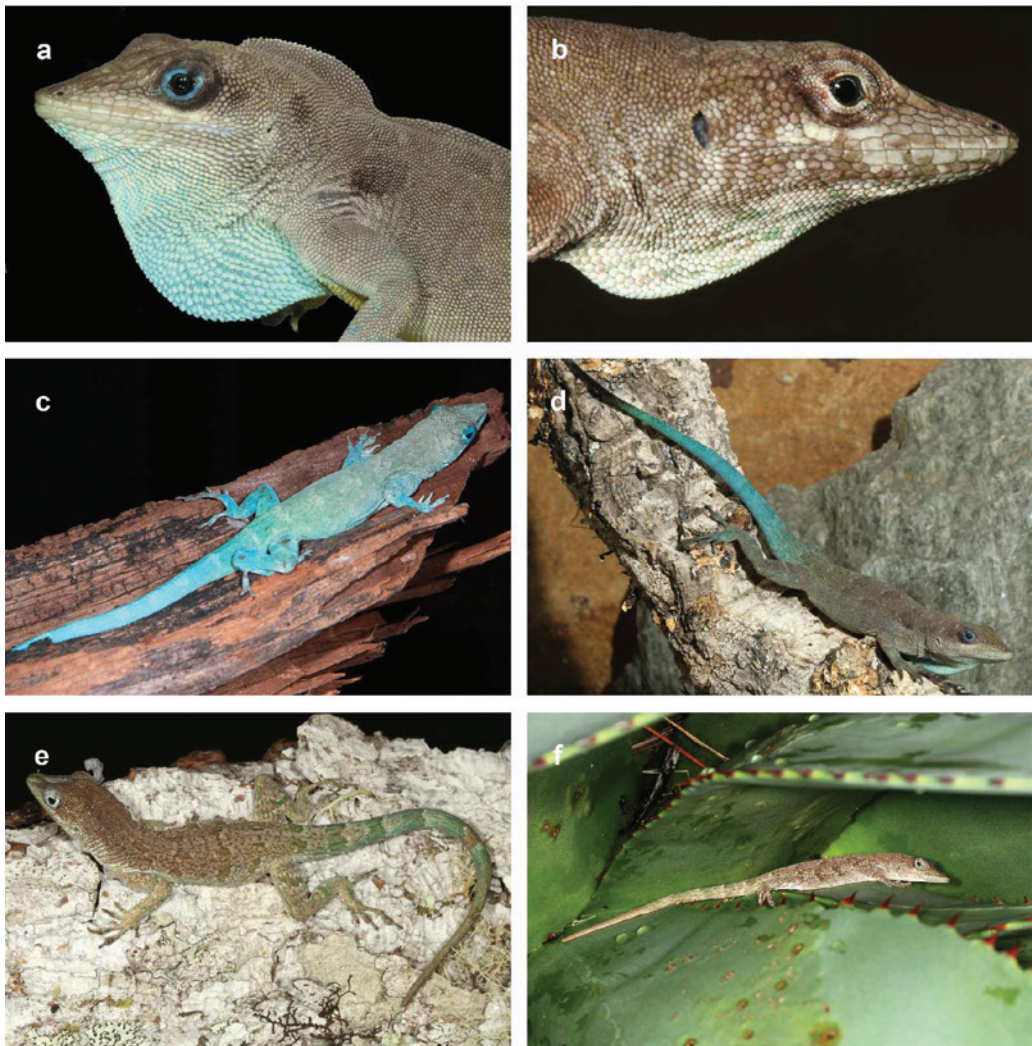


Figure 66. *Anolis divius* sp. nov. in life. (a) SMF 97970; (b) SMF 97965; (c) SMF 98171; (d) SMF 97970; (e) SMF 97969; (f) SMF 97969. (a,c,d) are males, (b,e,f) are females. Photos (a,b,d,e,f) by G.K., (c) by Eladio Fernández.



Figure 67. Habitat of *Anolis divius* sp. nov. (a,b) Parque Nacional Sierra de Bahoruco, Canote - El Alcáje road (18.18652, -71.57501, 1950 m), Santo Domingo Province, Dominican Republic. Photos by G.K. on 31 October 2013.

Anolis eladioi sp. nov.

Figs. 68–72

Anolis singularis: Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 97971, an adult male from Los Arroyos (18.23679, -71.75261), 1265 m, Province Pedernales, Dominican Republic; collected 30 October 2013 by Gunther Köhler and Eladio Fernández. Field tag number GK-4808.

Paratypes. All from Province Pedernales, Dominican Republic: SMF 97984 (KJ566864, KJ566909), 97985, 97986 (KJ566865, KJ566910), 97987–89, 97991 (KJ566866, KJ566911), 97993, 97995, 97996 (KJ566868, KJ566913), 98032, 98193–94, same collecting data as holotype. KU 253064, 1 km N Los Arroyos, collected 27 May 1969 by J. A. Rogers jr. KU 216091, 2.6 mi S Los Arroyos, collected 25 August 1971 by local collectors and given to Albert Schwartz. KU 216089, 5 km NE Los Arroyos, collected 27 June 1964 by local collectors and given to Albert Schwartz. KU 216092, 7 km N Cabeza de Agua, collected 20 December 1976 by local collectors and given to Albert Schwartz. MCZ R-150005, 100 m E km 25 marker, Alcoa Road, collector and collecting date unknown. SMF 97990, 97994 (KJ566867, KJ566912), Parque Nacional Sierra de Bahoruco, La Charca (18.12103, -71.59775), 1150 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. USNM 558718 (KJ566846, KJ566900), Mencia-Altigracia road, 1 km S Altigracia (18.18342, -71.72837), 700 m, collected at unknown date by local collectors.

Referred specimens. Haiti. Ouest: Savane Zombi: USNM 217458; Savane Zombi: MCZ R-124629, 124633, 124638, 124641–44, 124646, 124650, 124617; Sud'Est: Thiotte: MCZ R-124654; Thiotte, on road to Saltrou: MCZ R-131159, 131161, 131163.

Diagnosis. A moderate-sized to moderately large species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger*, *A. divius*, *A. singularis*, and the species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows, central gorgetal scales smaller than those on posterior portion of dewlap; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. eladioi* is most similar to *A. aliniger*, *A. divius*, *A. singularis*, and the species described below. *Anolis eladioi* differs from *A. aliniger* by the lack of a black axillary blotch (vs. such a blotch usually present in) and by having a pale blue to grayish blue iris in life (vs. brown to reddish brown in *A. aliniger*). *Anolis eladioi* differs from *A. singularis* (1) by usually having the sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent to this row in *A. singularis*) and (2) by having the two median dorsal scale rows only slightly enlarged, usually less than twice the size of the adjacent scales (vs. the two median dorsal scale rows distinctly enlarged, about twice the size of the adjacent scales in *A. singularis*). *Anolis eladioi* differs from *A. divius* by having the central gorgetal scales smaller than those on posterior portion of dewlap (vs. central gorgetals about subequal in size as those on posterior portion of dewlap in *A. divius*), and by having an overall green coloration (vs. some body parts pale to bright blue in *A. divius*). For differences between *A. eladioi* and the species described below, see the respective accounts of the new species.

Description of the holotype. Adult male, as indicated by partly everted hemipenes and presence of a pair of greatly enlarged postcloacal scales; SVL 50.0 mm; tail length 79.0 mm (complete); tail slightly compressed in cross section, tail height 3.5 mm and width 3.1 mm; axilla to groin distance 18.0 mm; head length 15.0 mm, head length/SVL ratio 0.30; snout length 7.2 mm; head width 8.0 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 10.6 mm, shank length/head length ratio 0.71; longest finger of extended forelimb reaching to a point 2.7 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 3.6 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region smooth or keeled, unicarinate; other dorsal head scales smooth, rugose, or keeled; 7 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in ill-defined prefrontal depression mostly smooth or rugose; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 5 to 6 moderately enlarged, keeled scales arranged in 3 to 4 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 1 to 2 rows of small keeled scales extending between enlarged supraorbitals and superciliary; a moderate parietal depression present; interparietal scale well developed, 1.3 x 0.9 mm (length x width), surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 large and 2 small anterior canthal scales; 7 scales present between second canthals; 10 scales present between posterior canthals; 18 (right)–18 (left) mostly keeled loreal scales in a maximum of 4 (right)–3 (left) horizontal rows; 6 keeled subocular scales arranged in a single row; 7 supralabials to level below center of eye; 5 suboculars broadly in contact with 5 supralabials; ear opening 0.7 x 1.1 mm (length x height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 6 postmentals, outer ones slightly larger than median ones; 7 infralabials to level below center of eye; sublabials not or only moderately enlarged (< four times the size of

medial postmental scales); scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; dewlap more or less evenly covered with large, keeled gorgetal scales, the posterior ones larger than central and anterior ones; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.40 x 0.25 mm (length x width); about 42 medial dorsal scales in one head length; about 67 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.25 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.45 x 0.45 mm (length x width); about 36 medial ventral scales in one head length; about 55 medial ventral scales between levels of axilla and groin; 116 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.4 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 4 to 5 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 33 lamellae under phalanges II–IV of Toe IV of hind limbs; 8 (right)–7 (left) scales under distal phalanx of Toe IV of hind limbs.

The coloration in life (Figs. 70b, 71c) was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Parrot Green (121) with Orange Rufous (56) blotches, edged with Sepia (279) on lateral neck; dorsal surface of anterior and middle portions of tail Apple Green (104) with Light Yellow Green (100) bands; distal portion of tail Dark Grayish Brown (284), tip of tail Cream Yellow (82); ventral surfaces of head, body, and legs Yellow Green (103) with a suffusion of Spectrum Yellow (79); dewlap Chartreuse (89) with a suffusion of Dark Yellow Buff (54); iris Deep Water Blue (181).

Coloration after six months preservation in 70% ethanol was recorded as follows: Dorsal ground color Grayish Olive (273) with a suffusion of Dark Grayish Olive (275) on dorsal and lateral head, body; ocelli on lateral neck Cinnamon-Drab (50) edged by Dusty Brown (285); ventral surface of head Pale Neutral Gray (296) with Dark Grayish Brown (284) streaks and mottling; ventral surface of body Light Bluish Gray (288) grading into Pale Greenish White (97) on posterior portion and with Medium Neutral Gray (298); ventral surface of legs Smoky White (261) with Smoke Gray (266) stipples; ventral surface of fingers and toes Dark Neutral Gray (299); dorsal, lateral, and ventral surface of tail Pratt's Payne's Gray (293) with indistinct Vandyke Brown (282) and with a suffusion of Dusty Brown (285).

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table I). The majority of specimens does not have the conspicuous ocellated blotches on neck as shown by the holotype of this species.

The coloration in life an adult male (SMF 97995; Fig. 70c) from the type locality was recorded as follows: Dorsal and lateral surfaces of head Olive–Green (123); dorsal surfaces of body and legs Parrot Green (121); circumorbital region Buff–Yellow (6); dorsal surface of anterior and middle portions of tail Light Grass Green (109) with Parrot Green (121) bands; distal portion of tail Glaucous (289) with a Sepia (286) band; tip of tail Buff (5); ventral surface of head Olive Clay Color (85); ventral surfaces of body and legs Medium Greenish Yellow (88) with a suffusion of Tawny (60) on lateroventral body; ventral surface of tail Light Yellowish Green (100) with Bunting Green (120) mottling; dewlap skin Light Cyan (159) with Medium Lime Green (114) gorgetals; iris Maroon (85). The coloration in life of another adult male (SMF

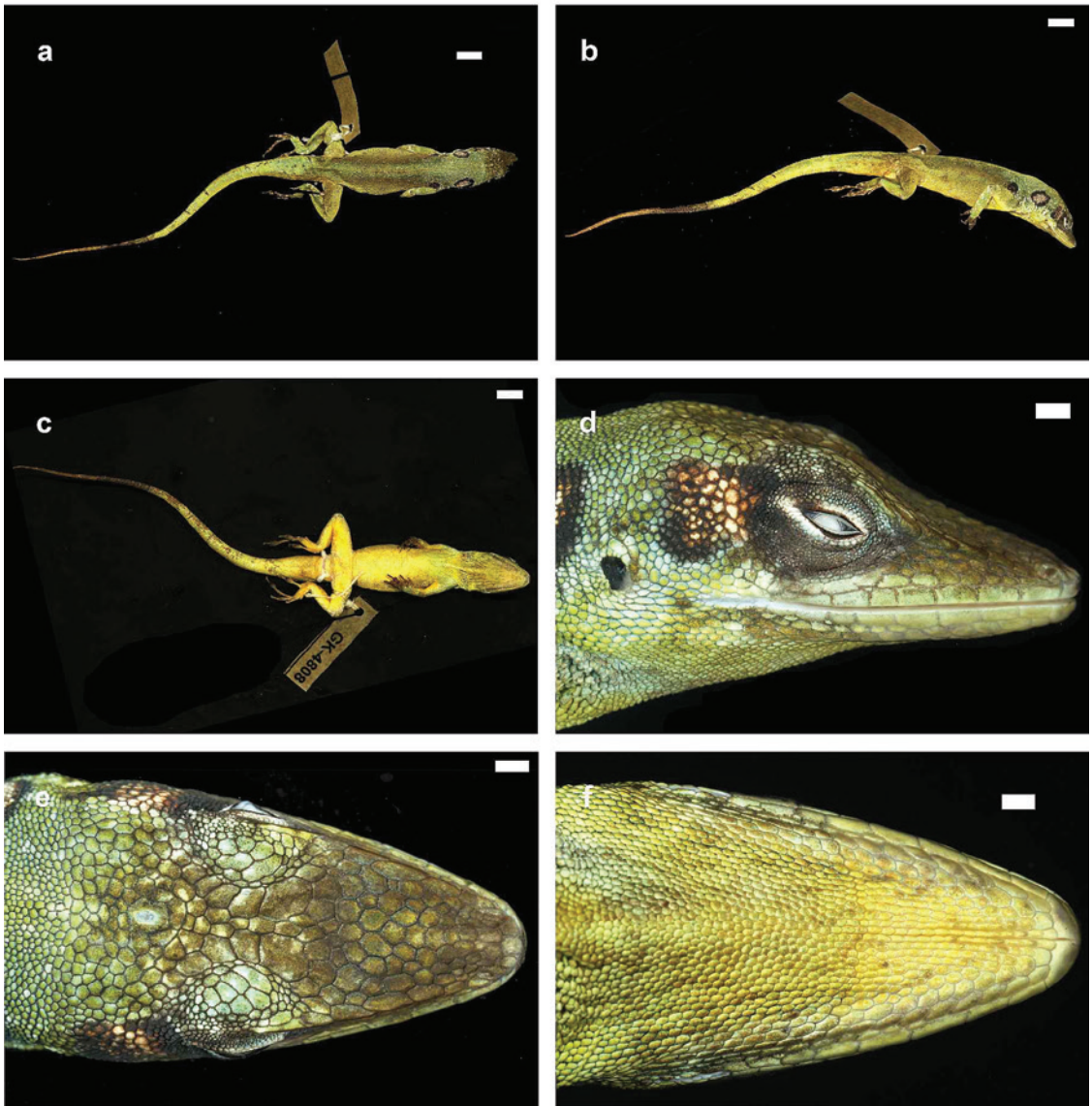


Figure 68. Holotype of *Anolis eladioi* sp. nov. (SMF 97971). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

98032) was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Parrot Green (121); circumorbital region Salmon Color (83); dorsal surface of anterior and middle portions of tail Apple Green (104) with indistinct Cream White (52) bands, the latter becoming Medium Greenish Yellow (88) on middle portion; distal portion of tail Dark Brownish Olive (127), tip of tail Cream Yellow (82); ventral surfaces of head, body, and legs Chartreuse (89); ventral surface of tail Olive Sulphur Yellow (90); dewlap skin Medium Cyan (116) with Light Yellow Green (100) gorgetals; iris Greenish Cyan (150). The coloration in life of a subadult female (SMF 98193) was recorded as follows: Dorsal and lateral surfaces of head, body, and legs Ground Cinnamon (270) with a Smoke Gray (266) lateral stripe; ventral surfaces of head, body, and legs Drab (19); ventral surface of tail Pale Pinkish Buff (3) with a suffusion of Light Smoke Gray (263).

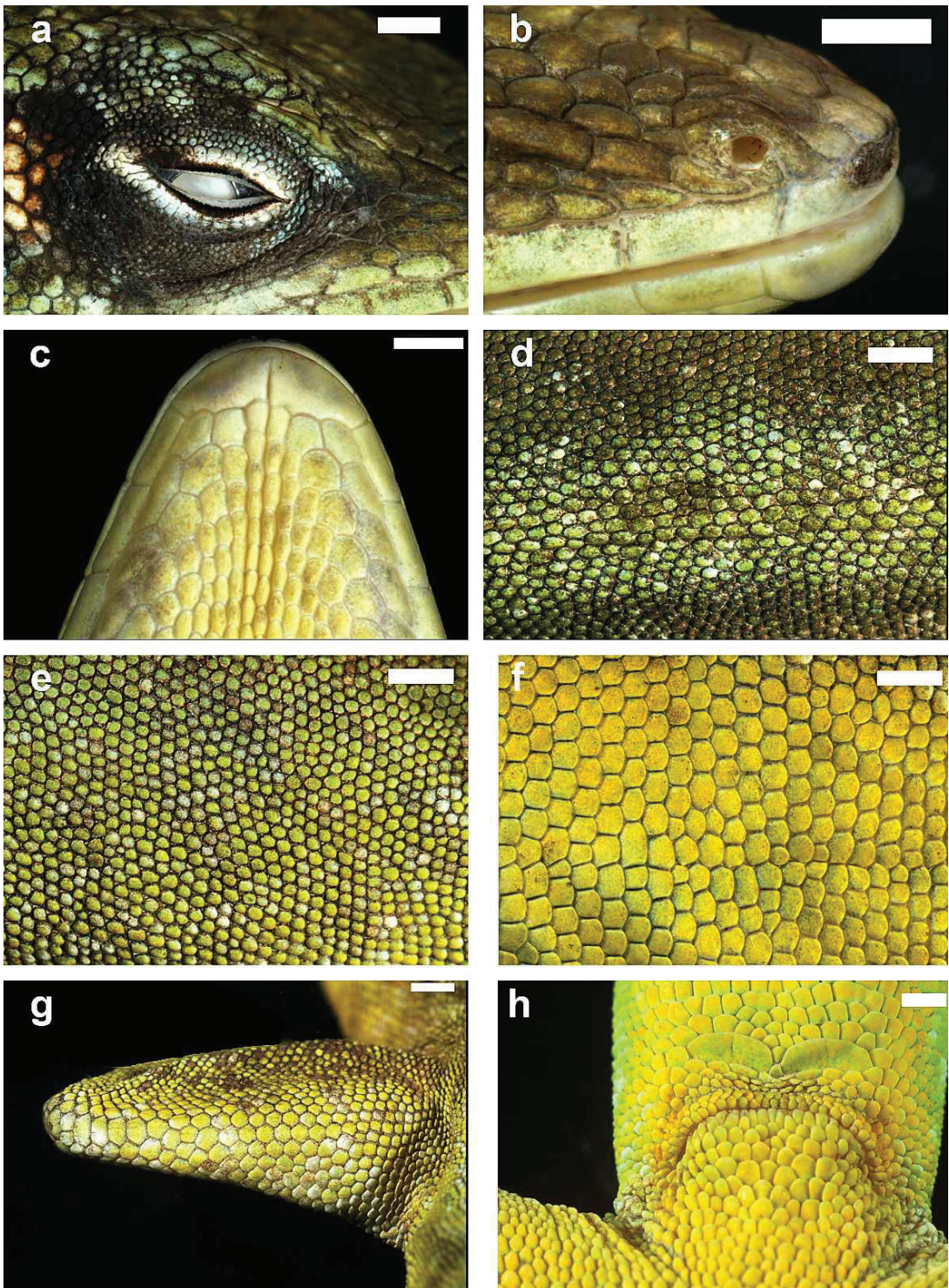


Figure 69. Holotype of *Anolis eladioi* sp. nov. (SMF 97971). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

The completely everted hemipenis (SMF 97995; Fig. 72) is a slightly bilobate organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation; an asulcate ridge present; apex strongly calyculate, truncus and asulcate ridge with transverse folds.

Etymology. The name *eladioi* is a patronym honoring Eladio Fernández, Santo Domingo, Dominican Republic, who first alerted SBH to this species.

Geographic distribution. As currently known, *Anolis eladioi* is restricted to the western portion of the Sierra de Bahoruco in the Dominican Republic and the adjacent mountain areas in Haiti from 700 to 1265 masl (Fig. 59).

Natural history notes. At Los Arroyos *Anolis eladioi* was relatively common during the visit of GK and Eladio Fernandez on 30 October 2013 with several of these lizards found on large coniferous trees along the main road (Fig. 73a). In the morning hours, they descended the tree trunks as low as 1 m above the ground. One male was observed licking water drops from leaves of a bush at about 1.5 m above ground (Fig. 74). At the same place we observed also several individuals of this species on the walls and below the zink roof of wooden houses (Fig. 68b). When approached, they sought refuge under the zink roof. Two individuals (SMF 97990, 97994) were collected at night while the lizards were sleeping in the periphery of pine tree branches, 3 to 5 m above the ground (Fig. 68d).

Conservation. Given its presumably small geographic range, we consider the conservation status of *Anolis eladioi* to be Critically Endangered based on criterion B1ab (iii) of the IUCN Red List Categories and Criteria (IUCN 2012).

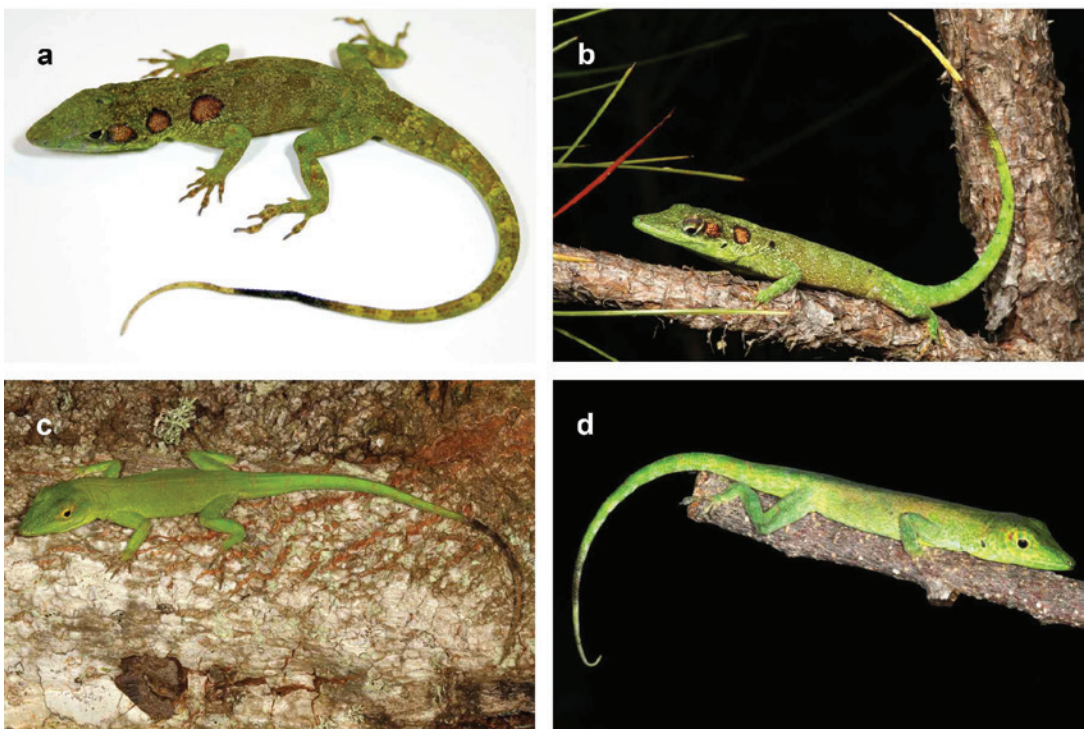


Figure 70. *Anolis eladioi* sp. nov. in life. (a) SBH 266730; (b) SMF 97968; (c) SMF 97995; (d) SMF 99013. (a–c) are males, (d) is a female. Photo (a) by S.B.H., (b–d) by G.K.

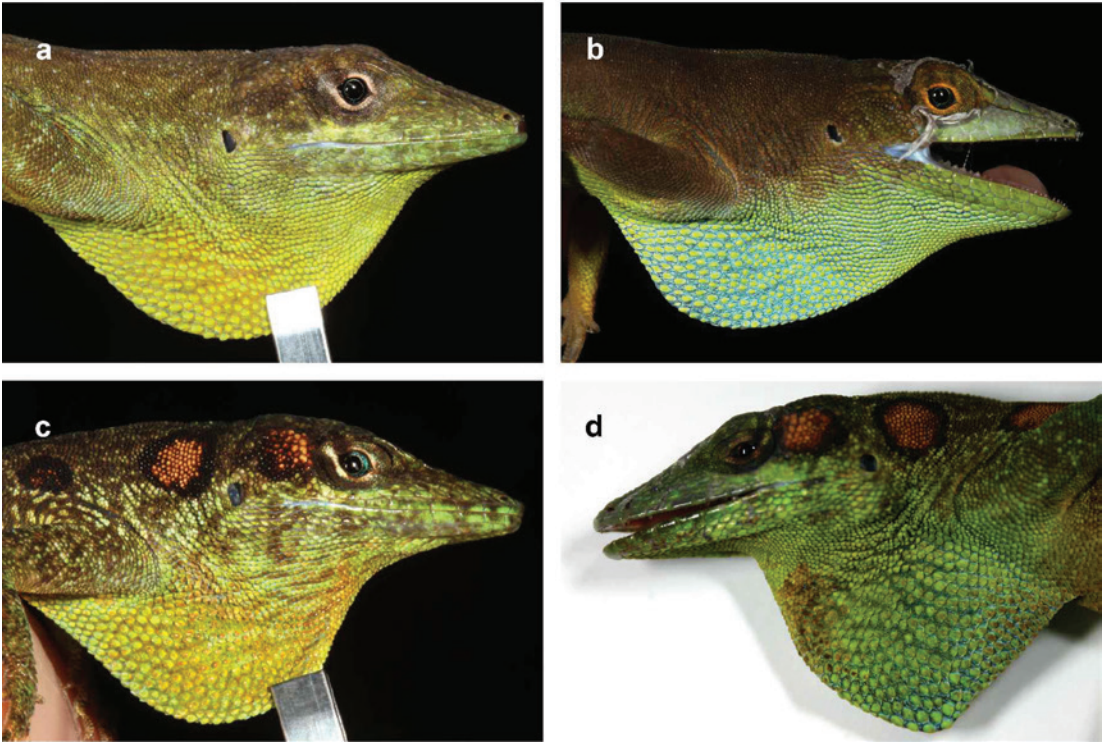


Figure 71. Dewlaps of *Anolis eladioi* sp. nov. in life (all males). (a) SMF 98032; (b) SMF 97996; (c) SMF 97968; (d) SBH 266730. Photos (a–c) by G.K., (d) by S.B.H.

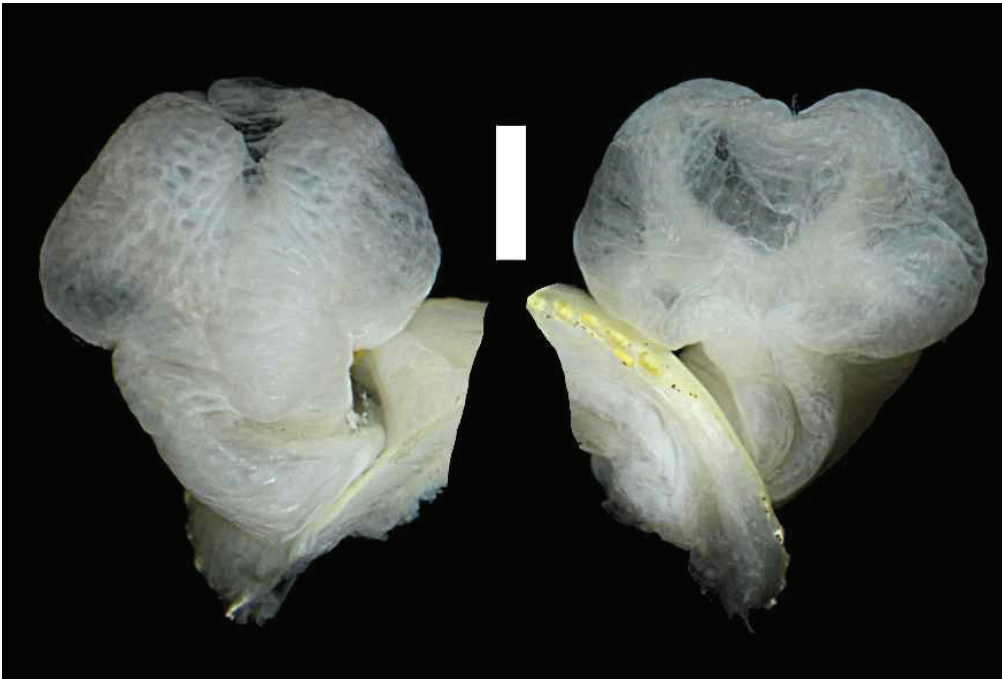


Figure 72. Hemipenis of *Anolis eladioi* sp. nov. (SMF 97995). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.



Figure 73. Habitat of *Anolis eladioi* sp. nov., all Pedernales Province, Dominican Republic, at (a,b) Los Arroyos (18.23679, -71.75261, 1265 m); (c) Parque Nacional Sierra de Bahoruco, near La Charca (18.121030, -71.59775, 1150 m); (d) road to Pelempito (18.11266, -71.62114, 755 m). (a,c,d) Photos by G.K. on 27–31 October 2013; (b) Photo by S.B.H. on 23 March 2004.



Figure 74. Adult male of *Anolis eladioi* sp. nov. licking water drops from leaves of a bush at about 1.5 m above ground. Photo by G.K. on 30 October 2013.

Anolis prasinorius sp. nov.

Figs. 75–77

Anolis singularis: Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 97992, an adult male from near Cortico (18.11163, -71.22293), 1340 m, Province Barahona, Dominican Republic; collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. Field tag number GK-4847.

Paratypes. All from Province Barahona, Dominican Republic: KU 216093, 13 mi SE Cabral, collected 28 August 1971 by local collectors and given to Albert Schwartz. KU 216094–95, 12.3 mi SE Cabral, collected 30 August 1971 by local collectors and given to Albert Schwartz. KU 216096, 16 km SW Cabral, collected 31 August 1971 by local collectors and given to Albert Schwartz. KU 253071, 21 km S Cabral, road to La Lanza, collected 3 January 1971 by D. C. Fowler. MCZ R-167755, 21 km SW Barahona at ‘Haitian Village’, collected 10 July 1983 by Glenn Flores. MCZ R-106993, entrance to Monteada Nueva on road to Polo: 1060 m, collected 28 July 1968 by Ernest E. Williams, A. Stanley Rand, and Eugenio de Jesus Marcano F. MCZ R-140145, 12.3 mi SE Cabral, collected 5 October 1973 by T. Preston Webster. MCZ R-146671, 22 km W Barahona on road to Jose Joaquim, collected 23 July 1975 by Ernest E. Williams and William E. Haas. SMF 97979, entrance of road to Cortico (18.13273, -71.26696), 1060 m, collected 31 October 2013 by Gunther Köhler and Marcos Rodríguez. SMF 98186 (KJ566831, EF531482), Loma del Curro, at crest of Sierra Martín García (18.36996, -71.01179), 1060 m, collected 30 May 1996 by S. Blair Hedges, Renee Sharp, Patrick Parker, and Kristin Nastase. SMF 97978, near Cortico (18.11137, -71.22675) 1410 m, collected 30 October 2013 by Gunther Köhler and Marcos Rodríguez. SMF 98187 (KJ566832, KJ566892), SMF 98188, 18.6 km S Cabral, 1000 m, collected 6 February 1996 by S. Blair Hedges, Renee Sharp, Patrick Parker, and Kristin Nastase. USNM 558737 (KJ566826, KJ566891), 18.6 km S Cabral, 1000 m, collected 27 July 1991 by Richard Thomas and S. Blair Hedges. USNM 558738 (EF531481), 18.6 km S Cabral, 1000 m, collected 31 May 1996 by S. Blair Hedges, Renee Sharp, Patrick Parker, and Kristin Nastase. USNM 329271 (KJ566810, KJ566885), USNM 329272, 15.3 km S, 6.7 km E (road) Cabral, collected 26 August 1984 by S. Blair Hedges.

Referred specimens. Dominican Republic. Azua: Sierra Martín García, Loma Aguacate, 1200 m: MCZ R-167781; Sierra Martín García: near peak of Loma del Copey, 700 m: MCZ R-167600.

Diagnosis. A moderate-sized species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger*, *A. divius*, *A. eladioi*, *A. singularis*, and the species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows, central gorgetal scales smaller than those on posterior portion of dewlap; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species treated in this contribution, *A. prasinorius* is most similar to *A. aliniger*, *A. divius*, *A. eladioi*, *A. singularis*, and the species described below. *Anolis prasinorius* differs from *A. aliniger* by the lack of a black axillary blotch (vs. such a blotch usually present in *A. aliniger*) and in being smaller in body size (SVL to 45 mm in males

and to 43 mm in females of *A. prasinorius* vs. SVL to 58 mm in males and to 52 mm in females of *A. aliniger*). *Anolis prasinorius* differs from *A. singularis* by having the sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent to this row). *Anolis prasinorius* differs from *A. divius* by having the central gorgetal scales smaller than those on posterior portion of dewlap (vs. central gorgetals about subequal in size as those on posterior portion of dewlap in *A. divius*), by having an overall green coloration (vs. some body parts pale to bright blue in *A. divius*), and in being smaller in body size (SVL to 45 mm in males and to 43 mm in females of *A. prasinorius* vs. SVL to 68 mm in males and to 55 mm in females of *A. divius*). *Anolis prasinorius* is a much smaller species than *A. eladioi* (SVL to 45 mm in males and to 43 mm in females of *A. prasinorius* vs. SVL to 63 mm in males and to 56 mm in females of *A. eladioi*). A gonadal examination of several specimens of *A. prasinorius* confirmed that this is indeed a tiny species: SMF 98186 (female, 35.4 mm SVL) has an oviducal egg, 11.1 mm long, filling body cavity; SMF 98187 (male, 44.1 mm SVL) and SMF 93188 (male, 35.9 mm SVL) both have greatly enlarged testes with convoluted tubules and sperm-filled ducts. *Anolis prasinorius* further differs from *A. eladioi* by having a brown to reddish brown iris in life (vs. pale blue to grayish blue in *A. eladioi*) and usually having the two median dorsal scale rows distinctly enlarged, about twice the size of the adjacent scales (vs. the two median dorsal scale rows only slightly enlarged, usually less than twice the size of the adjacent scales in *A. eladioi*). For differences between *A. prasinorius* and the species described below, see the respective accounts of the new species.

Description of the holotype. Subadult male, as indicated by presence of a pair of greatly enlarged postcloacal scales; SVL 42.0 mm; tail length 68.0 mm (complete); tail slightly compressed in cross section, tail height 3.1 mm and width 2.8 mm; axilla to groin distance 16.1 mm; head length 13.6 mm, head length/SVL ratio 0.32; snout length 6.5 mm; head width 7.2 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 9.4 mm, shank length/head length ratio 0.69; longest finger of extended forelimb reaching to a point 2.1 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 1.2 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region smooth or weakly keeled; other dorsal head scales smooth or rugose; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with both rostral and first supralabial; circumnasal in contact with first supralabial; scales in weak prefrontal depression smooth or rugose; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 4 to 5 moderately enlarged, smooth or rugose scales arranged in 3 to 4 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 1 to 2 rows of small scales extending between enlarged supraorbitals and superciliary; parietal depression absent; interparietal scale well developed, 1.0 x 0.9 mm (length x width), surrounded by scales of moderate size; 3 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 5 large and 2 to 3 small anterior canthal scales; 8 scales present between second canthals; 8 scales present between posterior canthals; 23 (right)–24 (left) mostly smooth or rugose, some faintly keeled loreal scales in a maximum of 4 (right)–4 (left) horizontal rows; 4 to 5 keeled subocular scales arranged in a single row; 8 supralabials to level below center of eye; 3 to 4 suboculars broadly in contact with 5 supralabials; ear opening 0.8 x 1.0 mm (length x height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 6 postmentals, outer ones much larger than median ones; 7 (right)–8 (left) infralabials to level below center of eye; 5 pairs of sublabials greatly enlarged; scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small (55 mm²), extending from level below anterior margin of eye to level of axilla; dewlap more or less evenly covered with large, keeled gorgetal scales, the posterior ones larger than central and anterior ones; a nuchal crest and a

dorsal ridge present; dorsum of body with smooth, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.38 x 0.25 mm (length x width); about 42 medial dorsal scales in one head length; about 69 medial dorsal scales between levels of axilla and groin; lateral scales smooth, granular and more or less homogeneous in size, average size 0.18 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.45 x 0.45 mm (length x width); about 38 medial ventral scales in one head length; about 51 medial ventral scales between levels of axilla and groin; 132 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.1 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth, non-mucronate, juxtaposed to subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad about 3 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 37 (right)–37 (left) lamellae under phalanges II–IV of Toe IV of hind limbs; 8 scales under distal phalanx of Toe IV of hind limbs.

The coloration in life was recorded as follows (Fig. 77a, c): Dorsal and lateral surfaces of head, body, and legs Parrot Green (121); dorsal surface of anterior and middle portions of tail Apple Green (104) with Medium Lime Green (114) bands; distal portion of tail Dark Brownish Olive (127), tip of tail Cream Yellow (82); ventral surface of head Olive Sulphur–Yellow (90), suffused with Tawny (60); ventral surfaces of body and legs Chartreuse (89); ventral surface of tail Yellowish Olive Green (118) with Smoke Gray (266) mottling on middle portion; iris Warm Sepia (40).

Coloration after two months preservation in 70% ethanol was recorded as follows: Dorsal ground color Pratt's Payne's Gray (293) with a suffusion of Dusky Brown (285) on dorsal and lateral head, body and limbs; flanks with Mars Brown (25) stipples; ventral surface of head Pale Neutral Gray (296) with Dark Grayish Brown (284) streaks and mottling; ventral surface of body Light Bluish Gray (288) grading into Pale Greenish White (97) on posterior portion and with Medium Neutral Gray (298); ventral surface of legs Smoky White (261) with Smoke Gray (266) stipples; ventral surface of fingers and toes Dark Neutral Gray (299); dorsal, lateral, and ventral surface of tail Pratt's Payne's Gray (293) with indistinct Vandyke Brown (282) and with a suffusion of Dusty Brown (285).

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table I). The longest toe of adpressed hind leg reaching to ear opening in SMF 97978–79. Dewlap size is 55 and 72 mm², respectively, in two males (SMF 98187 and 97992), and 15 mm² in a juvenile female (SMF 97979).

Etymology. The name *prasinorius* is a compound noun in apposition derived from *prasinus* (Greek for “green”) and *oreios* (Greek for “of the mountains”) referring to the overall green coloration of the animal and to its habitat in the Sierra de Bahoruco.

Geographic distribution. As currently known, *Anolis prasinorius* is restricted to the eastern portion of the Sierra de Bahoruco, and the Sierra Martín García, from 700 to 1410 masl (Fig. 59).

Natural history notes. All *Anolis prasinorius* encountered by SBH and GK were collected at night while the lizards were sleeping on little twigs in the periphery of large trees, usually in areas where the branches had few or no leaves, at 3 to 10 m above the ground. For a habitat image see Fig. 78.

Conservation. Given its presumably small geographic range, we consider the conservation status of *Anolis prasinorius* to be Endangered based on criterion B1ab (iii) of the IUCN Red List Categories and Criteria (IUCN, 2012).

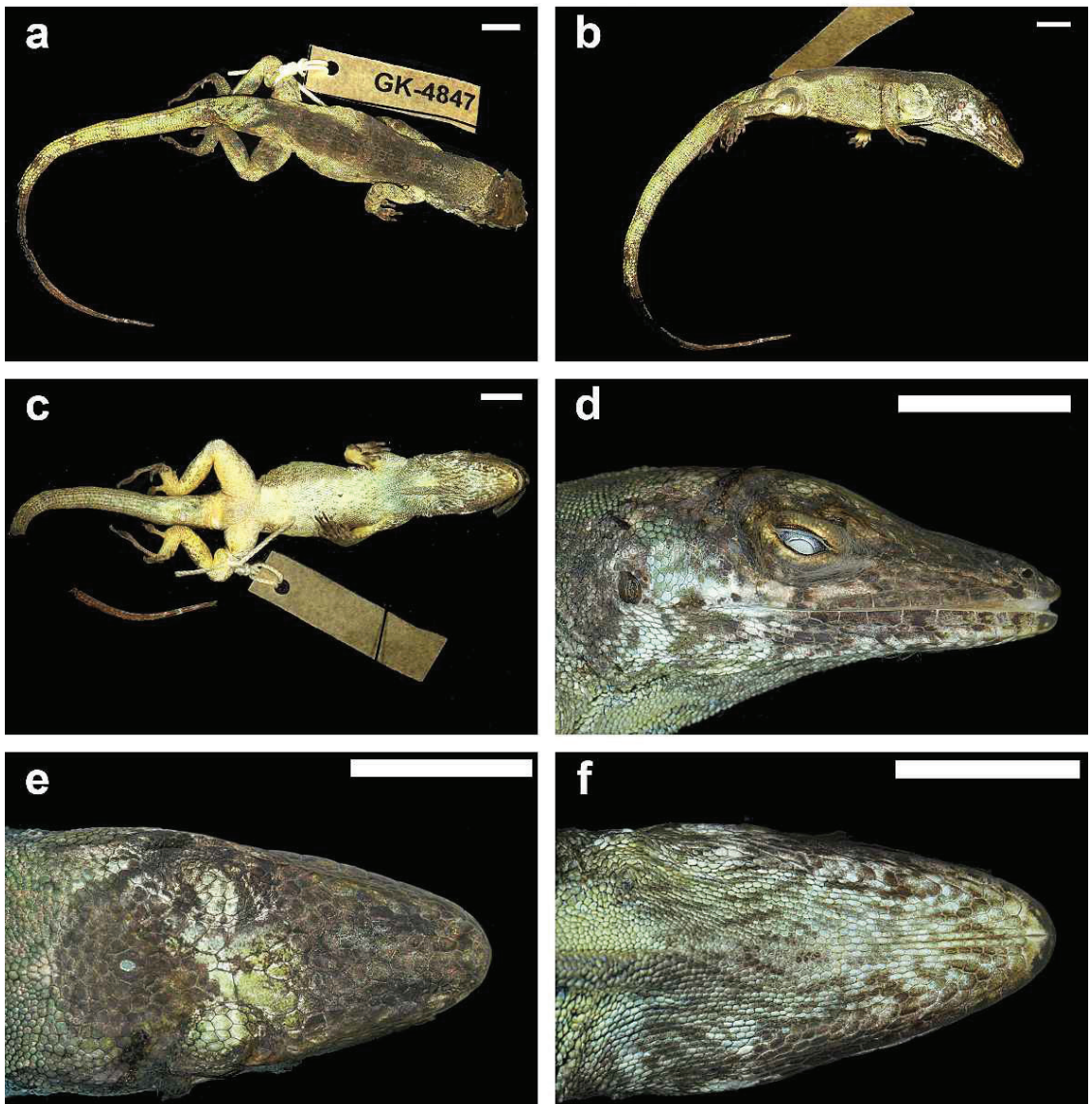


Figure 75. Holotype of *Anolis prasinorius* sp. nov. (SMF 97992). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

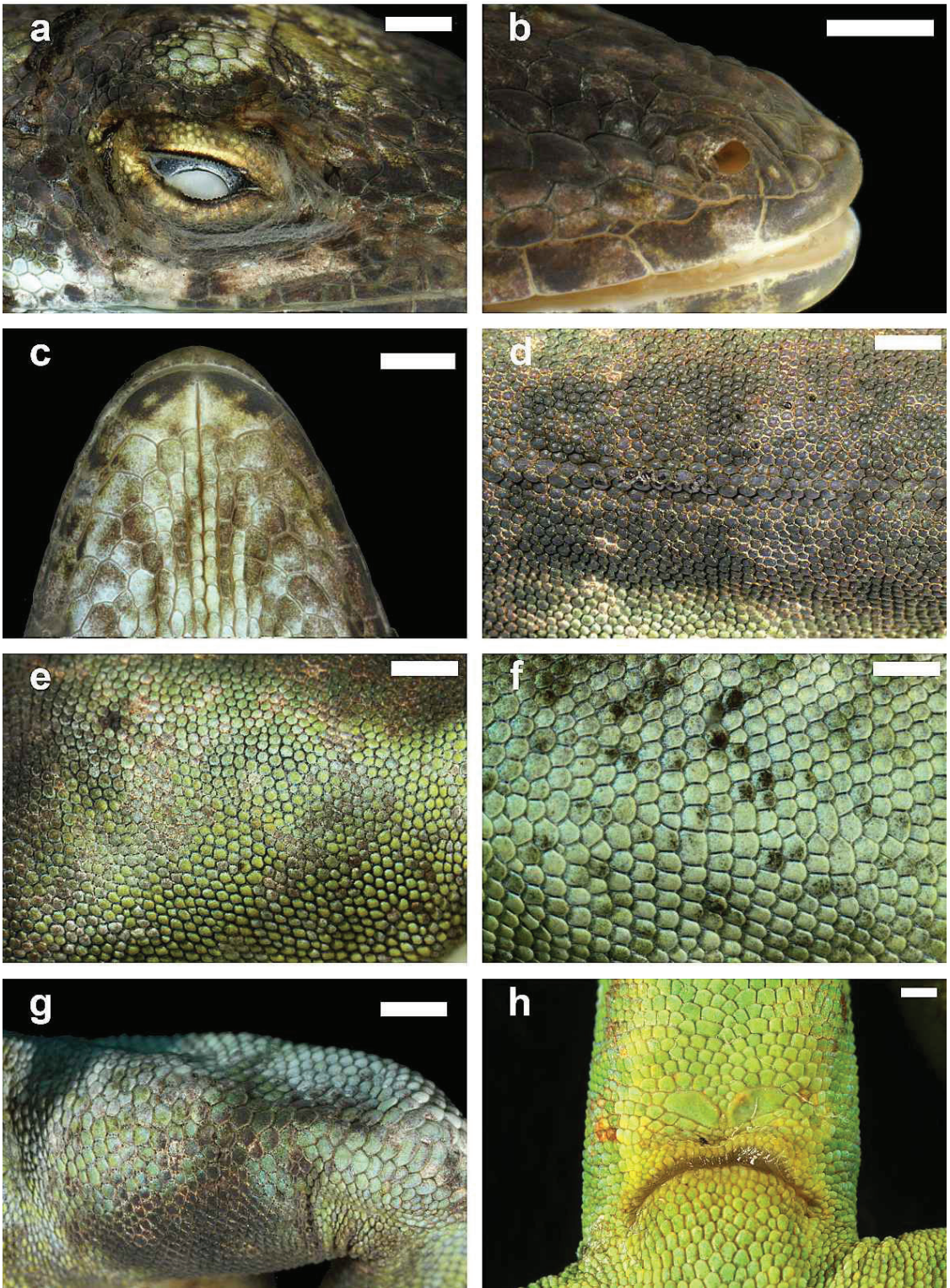


Figure 76. Holotype of *Anolis prasinorius* sp. nov. (SMF 97992). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

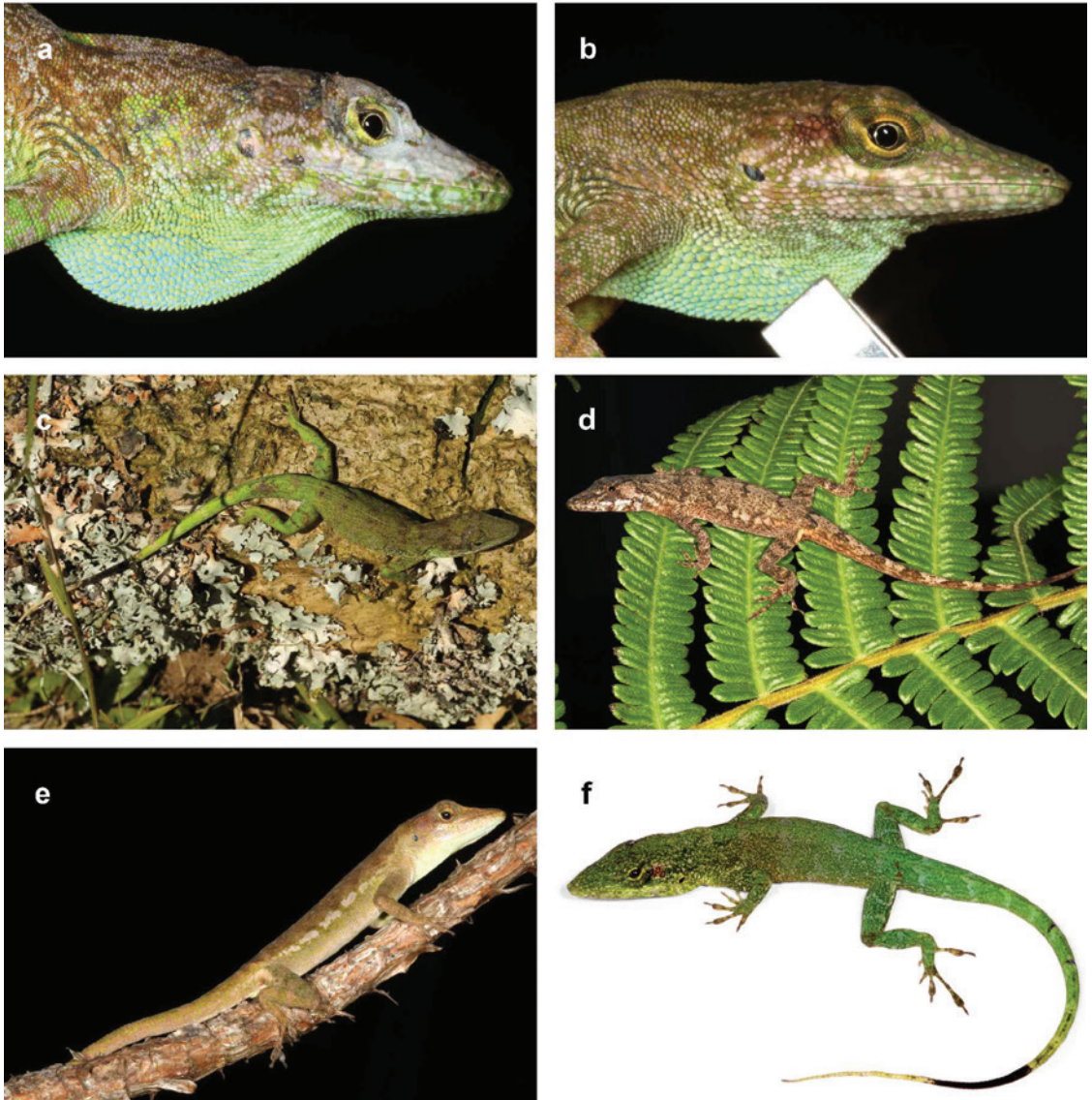


Figure 77. *Anolis prasinorius* sp. nov. in life. (a) SMF 97992; (b) SMF 97979; (c) SMF 97992; (d) SMF 97978; (e) SMF 97978; (f) SMF 98187. (a–c, f) are males, (d–e) are females. Photos (a–e) by G.K., (f) by S.B.H.



Figure 78. Habitat of *Anolis prasinorius* sp. nov. near Cortico, Laguna (18.11163 -71.22293, 1340 m), Barahona Province, Dominican Republic. Photo by G.K. on 31 October 2013.

Anolis apletolepis sp. nov.

Figs. 79–82

Anolis aliniger: Schwartz & Thomas, 1975 (in part.); Williams, 1976 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Powell, 2002 (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 98133, an adult male from Furcy, at Lodge (18.42037, -72.29777), 1575 m, Massif de la Selle, Département de l'Ouest, Haiti; collected 22 November 2009 by S. Blair Hedges. Field tag number USNM FS (field series) 268696.

Paratypes. MCZ 190696, La Visite National Park (18.33186, -72.28701), 1840 m, Département de l'Ouest, Haiti, collected 19 August 2009 by Luke Mahler. USNM 558684 (KJ566817, EF531484), Furcy (18.42793, -72.27962), 1665 m, Département de l'Ouest, Haiti, collected 22 May 1991 by S. Blair Hedges, Richard Thomas, Nicholas Plummer, and Manuel Leal. USNM 286908 (KJ566814), Gros Cheval, ca. 15 km W of, via logging roads, northeast slope of Pic La Selle, Département Sud'Est, Haiti, collected 18 November 1984 by S. Blair Hedges and Richard Thomas.

Diagnosis. A moderate-sized species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger*, *A. divius*, *A. eladioi*, *A. prasinorius*, *A. singularis*, and the species described below by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral

neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows, central gorgetal scales about the same size as those on posterior portion of dewlap; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. apletolepis* is most similar to *A. aliniger*, *A. divius*, *A. eladioi*, *A. prasinorius*, *A. singularis*, and the species described below from which it differs by having the scales on anterior surface of thigh conspicuously enlarged, mostly higher than long (vs. these scales not or only slightly enlarged, not higher than long). *Anolis apletolepis* differs from *A. singularis* by having the sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent to this row). *Anolis apletolepis* differs further from *A. eladioi* and *A. prasinorius* by having the central gorgetal scales about subequal in size as those on posterior portion of dewlap (vs. central gorgetals smaller than those on posterior portion of dewlap in *A. eladioi* and *A. prasinorius*). Also, *A. prasinorius* is smaller than *A. apletolepis* (SVL to 45 mm in males and to 43 mm in females of *A. prasinorius* vs. SVL to 59 mm in males and to 50 mm in females of *A. apletolepis*). For additional differences between *A. apletolepis* and the species described below, see the account of the new species.

Description of the holotype. Adult male, as indicated by presence of a pair of greatly enlarged postcloacal scales; SVL 58.0 mm; tail length 56.0 mm (regenerated); tail slightly compressed in cross section, tail height 4.3 mm and width 4.2 mm; axilla to groin distance 25.6 mm; head length 17.2 mm, head length/SVL ratio 0.30; snout length 8.6 mm; head width 10.0 mm; longest toe of adpressed hind limb reaching almost to ear opening; shank length 11.4 mm, shank length/head length ratio 0.66; longest finger of extended forelimb reaching to nostril; longest finger of adpressed forelimb reaching to a point 3.1 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region smooth; other dorsal head scales smooth or rugose; 5 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with first supralabial; scales in moderate prefrontal depression smooth; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 5 to 7 moderately enlarged, smooth scales arranged in 3 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 1 to 2 rows of small smooth to weakly keeled scales extending between enlarged supraorbitals and superciliary; a weak parietal depression present; interparietal scale well developed, 1.5 x 0.9 mm (length x width), surrounded by scales of moderate size; 3 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 4 to 5 large and 2 to 3 small anterior canthal scales; 7 scales present between second canthals; 9 scales present between posterior canthals; 15 mostly smooth or rugose, some keeled loreal scales in a maximum of 4 (right)–3 (left) horizontal rows; subocular series damaged and partially replaced by scar tissue; 7 supralabials to level below center of eye; suboculars broadly in contact with supralabials; ear opening 0.9 x 1.8 mm (length x height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 5 postmentals, outer ones slightly larger than median ones; 6 (right)–7 (left) infralabials to level below center of eye; sublabials not or only moderately enlarged (< four times the size of medial postmental scales); scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of axilla; dewlap more or less evenly covered with large, keeled gorgetal scales, the posterior and central ones larger than anterior ones; a nuchal crest and a dorsal ridge present; dorsum of body with smooth to faintly keeled, juxtaposed scales; 2 medial rows slightly to

moderately enlarged; largest dorsal scales about 0.50 x 0.42 mm (length x width); about 38 medial dorsal scales in one head length; about 62 medial dorsal scales between levels of axilla and groin; lateral scales smooth, granular and more or less homogeneous in size, average size 0.30 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.55 x 0.55 mm (length x width); about 32 medial ventral scales in one head length; about 50 medial ventral scales between levels of axilla and groin; 128 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.6 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth to weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh conspicuously enlarged, mostly higher than long; digital pads dilated, dilated pad 3 to 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 34 (right)–34 (left) lamellae under phalanges II–IV of Toe IV of hind limbs; 7 scales under distal phalanx of Toe IV of hind limbs.

Coloration after four years and two months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head, body, limbs, and tail Vandyke Brown (282) with Dark Pearl Gray (282) and Medium Blue Gray (193) suffusions and mottling; ventral surface of head Light Sky Blue (191) with suffusions of Dark Pearl Gray (282) laterally; ventral surface of neck Burnt Umber (48); chest region Pratt's Payne's Gray (293); venter Hair Brown (277) with a central suffusion of Smoke Gray (267); ventral surfaces of forelimbs Light Buff (2); ventral surfaces of hind limbs Smoke Gray (266) with a suffusion of Light Bluish Gray (288); ventral surface of tail Olive-Brown (278) with a suffusion of Pratt's Payne's Gray (293) on base.

Variation. The paratypes agree well with the holotype in general appearance, morphometrics and scalation (see Table I).

The completely everted hemipenis (MCZ 190696; Fig. 82) is a small unilobed organ; sulcus spermaticus bordered by well developed sulcal lips and opening into a single large apical field void of ornamentation.

Etymology. The name *apletolepis* is a composite noun in apposition derived from *apleto* (Greek for “large”) and *lepis* (Greek for “scale”) referring to the enlarged scales on the anterior surface of thigh.

Geographic distribution. As currently known, *Anolis apletolepis* is restricted to the La Selle mountain range in southeastern Haiti and the adjacent western portion of the Sierra de Bahoruco in the Dominican Republic from 1575 to 1840 masl (Fig. 59).

Natural history notes. USNM 286908 was caught during daytime in bromeliads about 3 m above ground in pine trees. USNM 558684 was collected at night while the lizard was sleeping on a twig, 2 to 3 meters high. For a habitat image see Fig. 83.

Conservation. Given its restricted geographic range and continuing threat of habitat loss through deforestation, we consider the conservation status of *Anolis apletolepis* to be Endangered based on criterion B1ab (iii) of the IUCN Red List Categories and Criteria (IUCN 2012).

Remarks. SBH 266731 (KJ566838, KJ566895), a specimen from Zapotén, 1678 m (Dominican Republic, Province Independencia) was used in the molecular genetic analysis but cannot be located and might be lost.

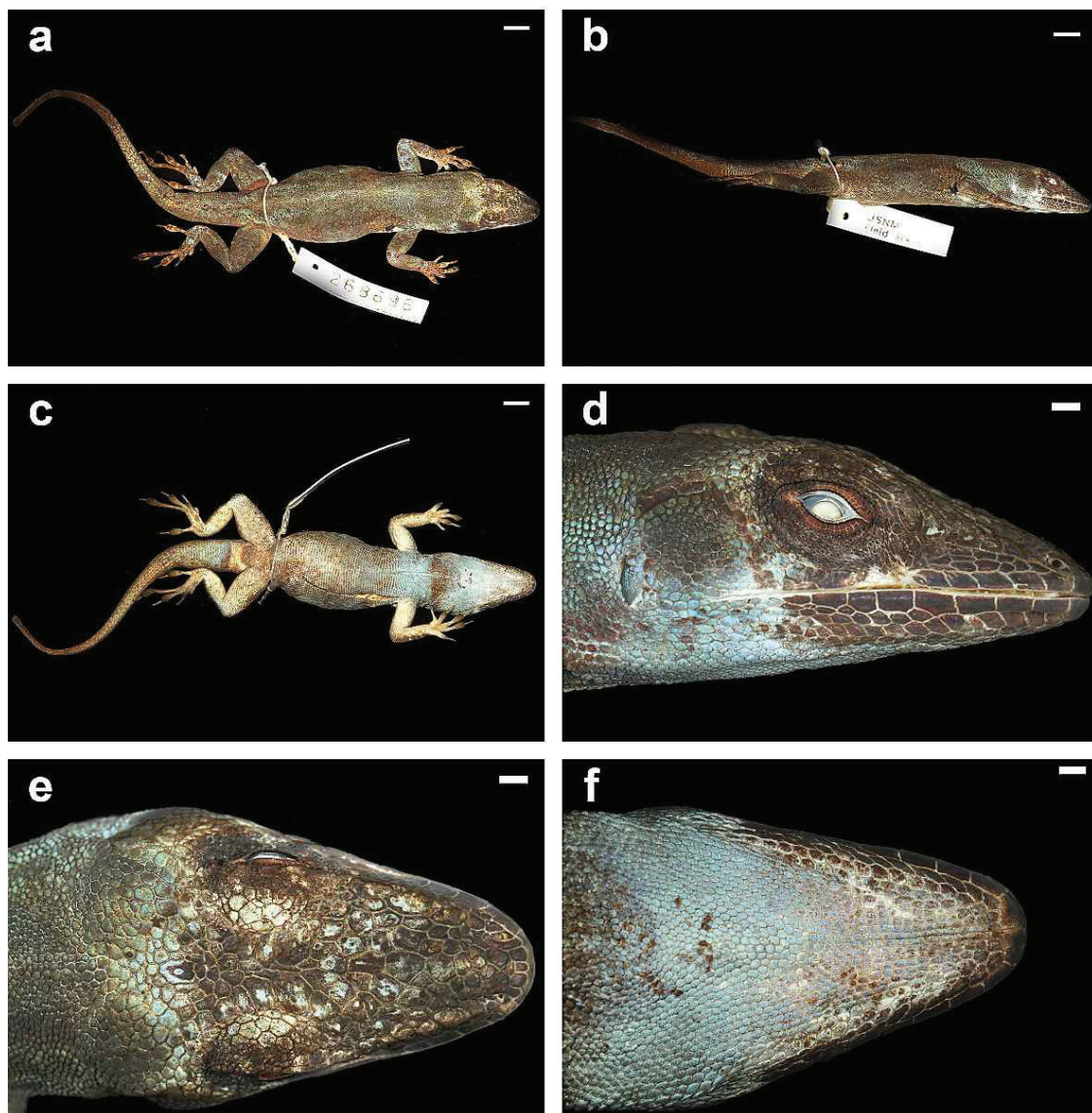


Figure 79. Holotype of *Anolis apoletlepis* sp. nov. (SMF 98133). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G.K.

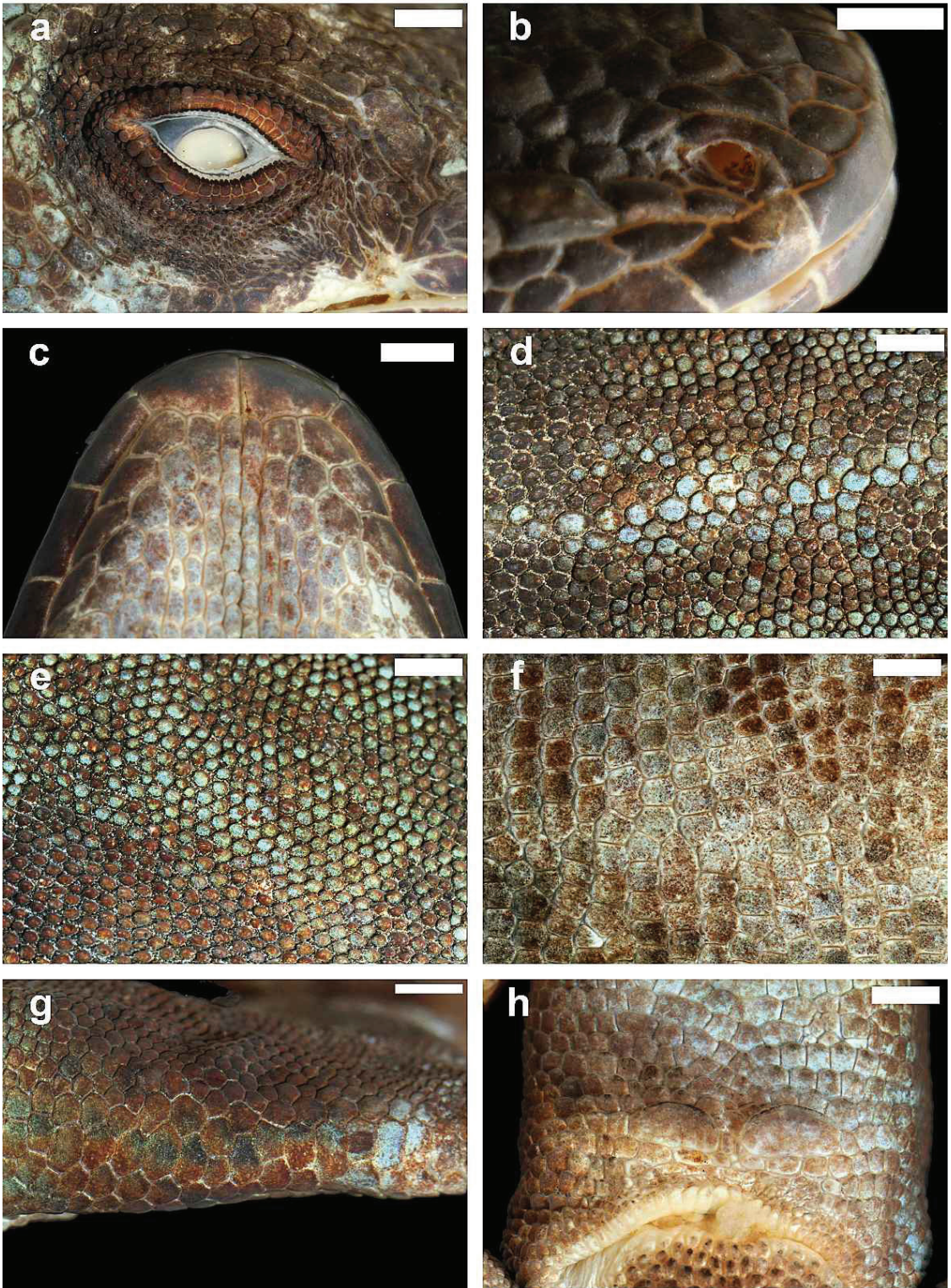


Figure 80. Holotype of *Anolis apletolepis* sp. nov. (SMF 98133). (a) superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G.K.

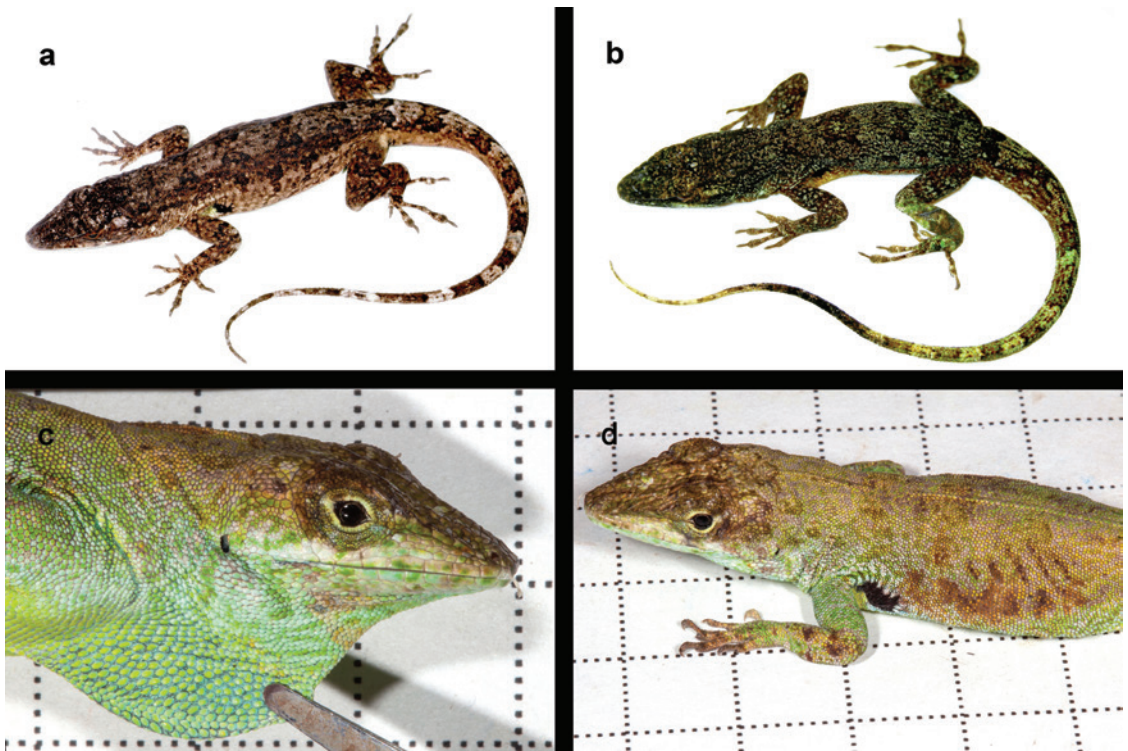


Figure 81. *Anolis apletolepis* sp. nov. in life (all males). (a) USNM 286908; (b) SBH 266731; (c,d) MCZ 190696. (a,b) Photos by S.B.H.; (c,d) Photos by Luke Mahler.

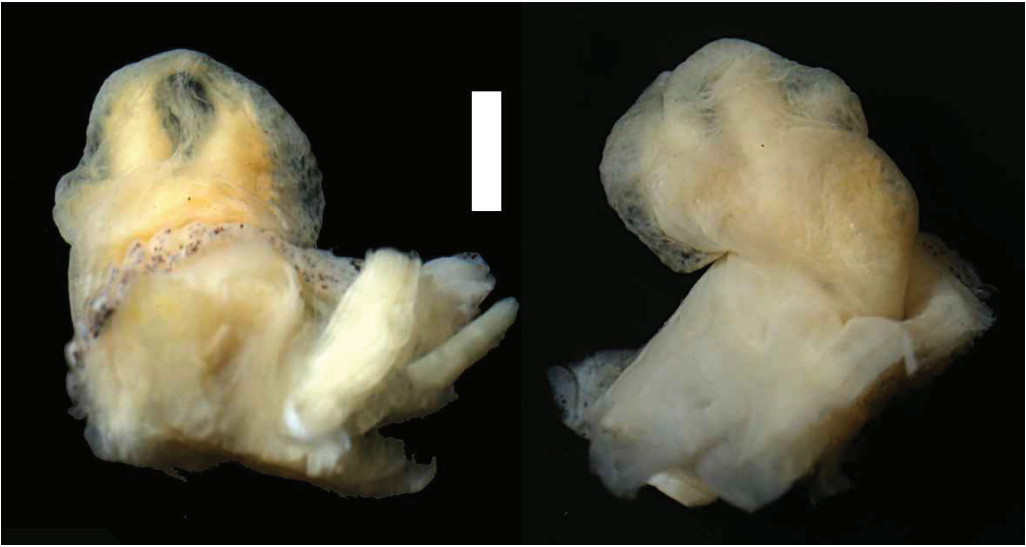


Figure 82. Hemipenis of *Anolis apletolepis* sp. nov. (MCZ 190696). (left) Sulcate view; (right) asulcate view. Scale bar equals 1.0 mm. Photos by G.K.



Figure 83. Habitat of *Anolis apletolepis* sp. nov., in pine forest near Zapotén (18.30707 -71.69547, 1678 m), Independencia Province, Dominican Republic. Photo by S.B.H. on 23 March 2004.

Anolis gonavensis sp. nov.
Figs. 84–86

Anolis singularis: Williams, 1965 (in part.); Schwartz & Thomas, 1975 (in part.); Schwartz, 1980 (in part.); Henderson & Incháustegui, 1984 (in part.); Henderson & Schwartz, 1984 (in part.); Schwartz & Henderson, 1988 (in part.); Schwartz & Henderson, 1991 (in part.); Powell *et al.*, 1996 (in part.); Henderson & Powell, 2009 (in part.).

Holotype. SMF 98172 (KJ566849), an adult male from Île de la Gonâve (18.75323, -72.85667), 362 m, Département de l'Ouest, Haiti; collected 31 March 2011 by Miguel Landestoy. Field tag number USNM FS (field series) 269349.

Paratype. USNM 558719 (KJ566850), near La Source, Île de la Gonâve, Département de l'Ouest, Haiti (18.94535, -73.15050), 7 m, Province Ouest, Haiti; collected 2 April 2011 by S. Blair Hedges.

Referred specimens Haiti. Ouest: Île de la Gonâve: MCZ 13778 (Williams 1965, not examined by authors); Île de la Gonâve, Nan Cafe (18.80861, -72.98389), 449 m: YPM 3229 (Williams 1965, not examined by authors).

Diagnosis. A moderate-sized species of *Anolis* that differs from all other Hispaniolan congeners except *A. aliniger*, *A. apletolepis*, *A. divius*, *A. eladioi*, *A. prasinorius*, and *A. singularis* by the combination of having (1) predominantly green overall coloration in life (capable of rapid color change to brown); (2) no white subocular stripe and no white streak onto lateral neck (3) relatively short hind legs (fourth toe of adpressed hind leg reaching to ear opening or only slightly beyond ear opening); (4) the ventral scales at midbody smooth; (5) <38 subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs; (6) male dewlap yellowish green or brown (after metachrosis) in life with longitudinal single rows of gorgetal scales or gorgetals not arranged in rows; and (7) a relatively short tail (ratio tail length/SVL <1.7). Among the *Anolis* species occurring treated in this contribution, *A. gonavensis* is most similar to *A. aliniger*, *A. divius*, *A. eladioi*, *A. apletolepis*, *A. prasinorius*, and *A. singularis*, but differs from all these species by having predominately grayish brown overall coloration in life (vs. predominantly green or blue in life; however, these species are capable of rapid metachrosis to brown); at least none of the specimens of *A. gonavensis* known to us showed any green coloration in life. *Anolis gonavensis* differs from *A. aliniger* by the lack of a black axillary blotch (vs. such a blotch usually present in *A. aliniger*). *Anolis gonavensis* differs from *A. singularis* by having the sublabial scales much larger than median scales adjacent to them (vs. sublabial scales about the same size as scales medially adjacent to this row). *Anolis gonavensis* differs from *A. eladioi* and *A. divius* by having a brown to reddish brown iris in life (vs. pale blue to grayish blue in *A. eladioi* and *A. divius*). *Anolis gonavensis* differs from *A. apletolepis* by having the scales on anterior surface of thigh not or only slightly enlarged, not higher than long (vs. these scales conspicuously enlarged, mostly higher than long in *A. apletolepis*). *Anolis gonavensis* differs from *A. prasinorius* by having the two median dorsal scale rows only slightly enlarged, usually less than twice the size of the adjacent scales (vs. the two median dorsal scale rows distinctly enlarged, about twice the size of the adjacent scales in *prasinorius*).

Description of the holotype. Subadult male, as indicated by presence of a pair of greatly enlarged postcloacal scales; SVL 42.5 mm; tail length 71.5 mm (complete); tail slightly compressed in cross section, tail height 2.6 mm and width 2.2 mm; axilla to groin distance 15.5 mm; head length 13.3 mm, head length/SVL ratio 0.31; snout length 6.7 mm; head width 6.7 mm; longest toe of adpressed hind limb reaching to ear opening; shank length 9.5 mm, shank length/head

length ratio 0.73; longest finger of extended forelimb reaching to a point 1.8 mm in front of tip of snout; longest finger of adpressed forelimb reaching to a point 1.4 mm in front of anterior insertion of hind limbs. Dorsal head scales in internasal region smooth or weakly keeled, uncarinate; other dorsal head scales mostly smooth, some rugose; 4 postrostrals; 6 scales between nasals; 1 elongate prenasal scale on each side, in contact with rostral; circumnasal in contact with first supralabial; scales in moderate prefrontal depression smooth; supraorbital semicircles well developed, separated medially by 1 scale row at narrowest point; supraorbital disc composed of 4 to 6 moderately enlarged, smooth to weakly keeled scales arranged in 2 to 3 rows; 1 row of circumorbital row, therefore, enlarged supraorbital scales separated from supraorbital semicircles; a single elongated superciliary, followed posteriorly by small, keeled, granular scales; 2 rows of small smooth scales extending between enlarged supraorbitals and superciliary; a weak parietal depression present; interparietal scale well developed, 1.2 x 1.0 mm (length x width), surrounded by scales of moderate size; 2 scales present between interparietal and supraorbital semicircles; canthal ridge distinct, composed of 5 large and 3 small anterior canthal scales; 10 scales present between second canthals; 11 scales present between posterior canthals; 24 (right)–21 (left) mostly smooth or rugose, some keeled loreal scales in a maximum of 4 (right)–3 (left) horizontal rows; 4 keeled subocular scales arranged in a single row; 7 supralabials to level below center of eye; 4 suboculars broadly in contact with 5 supralabials; ear opening 0.5 x 0.8 mm (length x height); mental distinctly wider than long, almost completely divided medially, bordered posteriorly by 6 postmentals, outer ones slightly larger than median ones; 6 (right)–7 (left) infralabials to level below center of eye; sublabials not or only moderately enlarged (< four times the size of medial postmental scales); scales in sublabial row much larger than scales medially adjacent to this row; smooth granular scales present on chin and throat; dewlap small, extending from level below anterior margin of eye to level of chest; a nuchal crest and a dorsal ridge present; dorsum of body with weakly keeled, juxtaposed scales; 2 medial rows slightly to moderately enlarged; largest dorsal scales about 0.32 x 0.20 mm (length x width); about 60 medial dorsal scales in one head length; about 80 medial dorsal scales between levels of axilla and groin; lateral scales keeled, granular and more or less homogeneous in size, average size 0.18 mm in diameter; ventrals at midbody smooth, flat, subimbricate, about 0.30 x 0.35 mm (length x width); about 54 medial ventral scales in one head length; about 61 medial ventral scales between levels of axilla and groin; 116 scales around midbody; ventral basal caudal scales smooth, all other caudal scales keeled; middorsal caudal scales moderately enlarged, not forming a crest; lateral caudal scales without whorls of enlarged scales, although an indistinct division in segments is discernible; a pair of greatly enlarged postcloacal scales present, about 1.0 mm wide; no tube-like axillary pocket present; scales on dorsal surface of forelimb smooth to weakly keeled, non-mucronate, subimbricate; scales on anterior surface of thigh weakly keeled, non-mucronate, subimbricate, about as long as high; digital pads dilated, dilated pad 4 times width of non-dilated distal phalanx; distal phalanx narrower than and raised from dilated pad; 32 (right)–32 (left) lamellae under phalanges II–IV of Toe IV of hind limbs; 7 scales under distal phalanx of Toe IV of hind limbs.

Coloration after two years and nine months preservation in 70% ethanol was recorded as follows: Dorsal and lateral surfaces of head Grayish Horn Color (268) with Sepia (279) suffusions and speckles; dorsal and lateral surfaces of neck and body Glaucous (272) with Dark Grayish Brown (284) transverse bands; dorsal and lateral surfaces of limbs and tail Russet (44) with Sepia (279) transverse bands; ventral surface of head Pale Buff (1) with Raw Umber (23) speckles; ventral surface of body Pale Buff (1) with Antique Brown (24) suffusion and transverse bands on lateral portions; ventral surfaces of limbs Pale Buff (1) with Raw Umber (23) speckles; ventral surface of tail Pale Buff (1) grading into Glaucous (289) on distal portion and with Dusky Brown (285) tip.

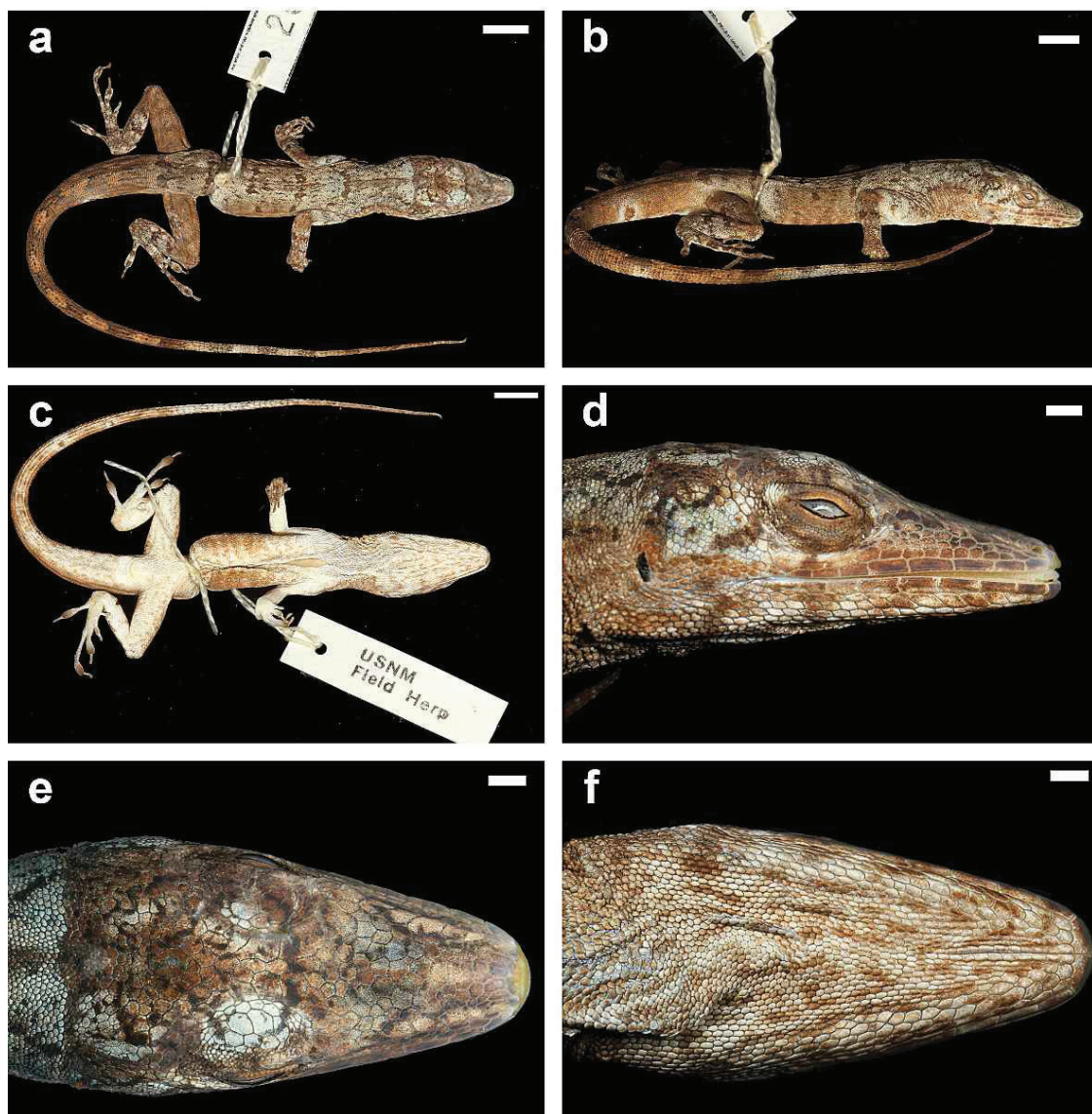


Figure 84. Holotype of *Anolis gonavensis* sp. nov. (SMF 98172). (a) Dorsal view; (b) lateral view; (c) ventral view; (d) lateral view of head; (e) dorsal view of head; (f) ventral view of head. Scale bars equal 5.0 mm in (a–c) and 1.0 mm in (d–f), respectively. Photos by G. K.

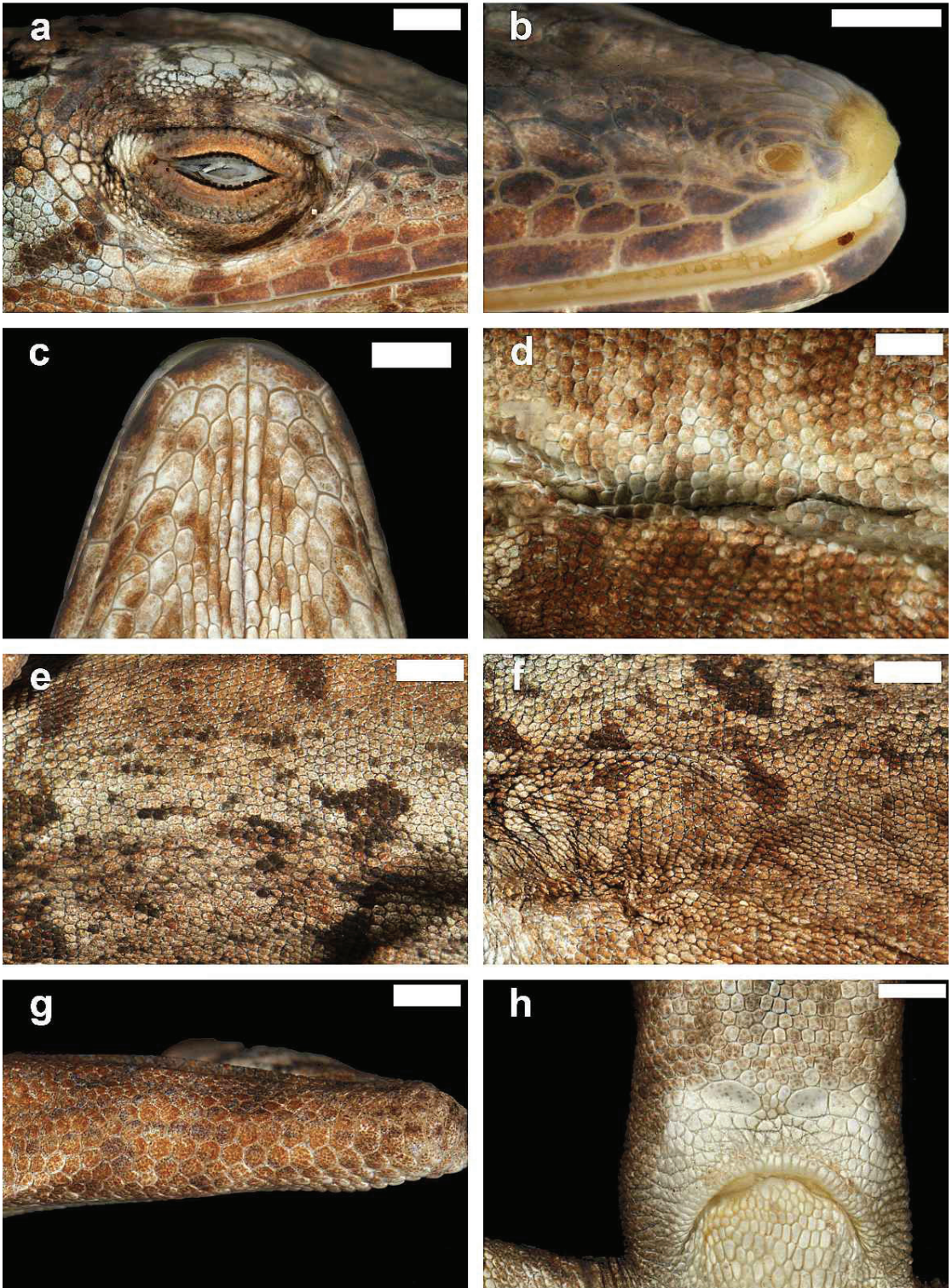


Figure 85. Holotype of *Anolis gonavensis* sp. nov. (SMF 98172). (a) Superciliary region; (b) nasal region; (c) chin region; (d) dorsal region (e) flank region; (f) midventer; (g) anterior surface of thigh; (h) cloacal region. Scale bars equal 1.0 mm. Photos by G. K.

Variation. The paratype USNM 558719 agrees well with the holotype in general appearance, morphometrics and scalation (see Table I).

Etymology. The name *gonavensis* is derived from Île de la Gonâve, Haiti, where the type specimens of the species were collected and where it is probably restricted, and the Latin suffix-*ensis* (denoting place or locality).

Geographic distribution. *Anolis gonavensis* is known only from Île de la Gonâve, Haiti from near sea level to about 360 masl (Fig. 59).

Natural history notes. The holotype was collected while sleeping on a small bush next to the road, at night, and the paratype was found among coconut husks under a palm tree near the beach (Fig. 87). The latter habitat is the only instance, that we are aware of, that a member of this *aliniger* species group has been taken at sea level.

Conservation. Given its small geographic range, highly fragmented habitats, and severe threat from deforestation, we consider the conservation status of *Anolis gonavensis* as Critically Endangered based on criterion B1ab(iii) of the IUCN Red List Categories and Criteria (IUCN 2012).

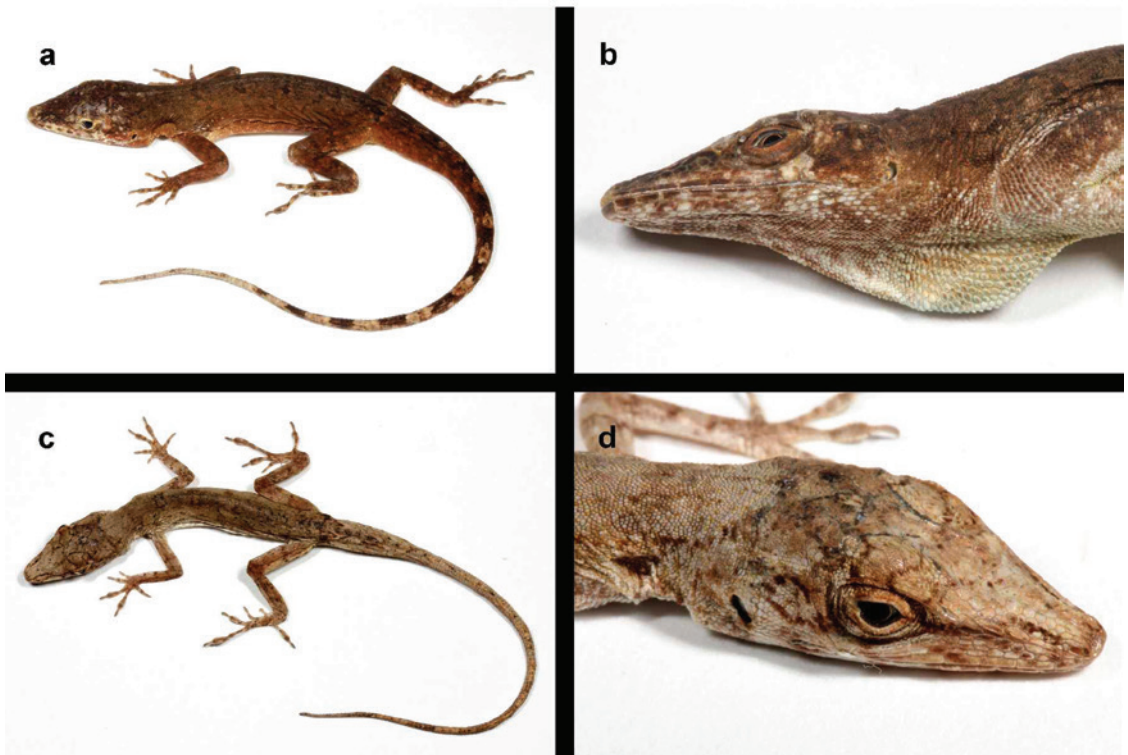


Figure 86. *Anolis gonavensis* sp. nov. in life. (a,b) SMF 98172 (male holotype); (c,d) USNM 558719 (female paratype). Photos by S.B.H.



Figure 87. Habitat of *Anolis gonavenensis* sp. nov. (paratype) in a beachside palm grove on Île de la Gonâve (18.94535, 73.15050, 7 m), Département de l'Ouest, Haiti. Photo by S.B.H. on 2 April 2011.

KEY TO THE SPECIES OF GREEN ANOLES FROM HISPANIOLA

Note: This key includes the introduced species *Anolis porcatius* because of its overall similarity to the species treated in this contribution.

- 1a. Outer postmental scales greatly enlarged, more than four times the size of the adjacent medial scales; dorsum with a cream to pale brown vertebral stripe; male dewlap pink.
..... *Anolis porcatius*
- 1b. Outer postmental scales slightly to moderately enlarged, less than four times the size of the adjacent medial scales; dorsum with or without a cream to pale brown vertebral stripe; male dewlap some shade of green, yellowish, brown, or blue 2
- 2a. Subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs >37 ; ratio tail length / SVL >1.7 , usually >2.0 ; usually no conspicuously dark colored distal portion of tail in front of pale colored tail tip, if a dark colored portion present, then this is in the transitional region of central to distal portion 3
- 2b. Subdigital lamellae on Phalanges II–IV of Toe IV of hind limbs <38 ; ratio tail length / SVL <1.7 ; distal portion of tail usually conspicuously dark colored in front of pale colored tail tip 9
- 3a. Male dewlap with longitudinal or oblique double rows of gorgetal scales not bicolored (without a darker posterior portion); 18–48, usually >28 loreal scales in a maximum of 3–7 rows; iris blue in life 4
- 3b. Dewlap with regularly spaced more or less homogeneous gorgetal scales bicolored with a darker posterior portion or not; 13–30, usually <28 loreal scales in a maximum of 3–5 rows; iris brown to reddish brown in life 8
- 4a. A distinct white subocular stripe and a white streak on lateral neck usually present; lateral side of body with a pattern of pale green vertical bars or blotches 5
- 4b. No white subocular stripe and no white streak on lateral neck; lateral side of body usually without a pattern of pale green vertical bars or blotches, if present, these markings ill-defined 7
- 5a. Ventral scales usually keeled; 4 or 5 supracaudals per caudal segment
..... *Anolis coelestinus*
- 5b. Ventral scales usually smooth; 5 supracaudals per caudal segment at least in the five proximal segments 6
- 6a. Tail pale with distinctive spots and bands; skin between scales in temporal region pale gray or dirty white; supralabials and infralabials relatively high, ratio height of first supralabial / SVL <0.011 ; head bulging out less, ratio intercanthal width at midpoint of eye center-to-narial distance / SVL <0.10 ; total number of loreal scales 29–49, mean 39.6.....
.....*Anolis chlorodius* sp. nov.
- 6b. Tail dark and without distinctive pattern; skin between scales in temporal region blackish; supralabials and infralabials relatively high, ratio height of first supralabial / SVL >0.011 ; head bulging out more, ratio intercanthal width at midpoint of eye center-to-narial distance / SVL >0.10 ; total number of loreal scales 21–42, mean 34.4 *Anolis viridius* sp. nov.

- 7a. Dewlap in life yellowish green to yellowish brown; total number of loreal scales 33–46, mean 41.4 *Anolis pecuarius*
- 7b. Dewlap in life dark gray to greenish gray; total number of loreal scales 30–35, mean 32.5 ...
..... *Anolis demissus*
- 8a. Pale brown blotches above and anterior to shoulder as well as immediately posterior to eye; total number of loreal scales 18–30; ventral scales usually faintly to weakly keeled or with groups of keeled scales among otherwise smooth ventral scales; male dewlap with a vermiculate pattern on anterior portion and without a strong suffusion of black pigment on posterior portion; adult females without longitudinal stripes on body *Anolis cyanostictus*
- 8b. No pale brown blotches above and anterior to shoulder as well as immediately posterior to eye; total number of loreal scales variable; ventral scales smooth or weakly keeled; male dewlap without vermiculate pattern on anterior portion and with a variable amount of suffusion of black pigment on posterior portion; adult females with or without longitudinal stripes on body 9
- 9a. Ventral scales weakly keeled; male dewlap without a suffusion of black pigment on posterior portion *Anolis leucodera* sp. nov.
- 9b. Ventral scales smooth; male dewlap with a suffusion of black pigment on posterior portion ..
..... 10
- 10a. A distinct white subocular stripe and a white streak on lateral neck often present, most obvious in life; skin on posterior portion of male dewlap black with widely spaced gorgetal scales; adult males with robust habitus *Anolis peynadoi*
- 10b. No white subocular stripe and no white streak on lateral neck; skin on posterior portion of male dewlap suffused with black pigment, but not entirely black, gorgetal scales not conspicuously widely spaced; adult males with relatively slender habitus *Anolis chlorocyanus*
- 11a. 10–18 loreal scales in 2–4 rows; adult males with pale to bright blue tail in life, or whole dorsal surface of animal blue, capable to rapid metachrosis to brown; adult females grayish brown with a greenish tail; central gorgetal scales of male dewlap about the same size as those on posterior portion of dewlap *Anolis divius* sp. nov.
- 11b. 14–30, usually >15 loreal scales in 3–4 rows; adult males and females with an overall green coloration, capable to rapid metachrosis to brown; central gorgetal scales of male dewlap smaller than or subequal to those on posterior portion of dewlap 12
- 12a. A black axillary blotch usually present, the area anterior to this blotch scaleless and in life suffused with orange or not 13
- 12b. No black axillary blotch, the area anterior to this blotch not scaleless and not heavily suffused with orange in life 14
- 13a. Scales on anterior surface of thigh not or only slightly enlarged, not higher than long
..... *Anolis aliniger*

- 13b. Scales on anterior surface of thigh conspicuously enlarged, mostly higher than long
 *Anolis apoletolepis* sp. nov.
- 14a. Sublabial scales about the same size as scales medially adjacent to this row; the two median dorsal scale rows distinctly enlarged, about twice the size of the adjacent scales
 *Anolis singularis*
- 14b. Sublabial scales much larger than median scales adjacent to them; the two median dorsal scale rows only slightly enlarged, usually less than twice the size of the adjacent scales 15
- 15a. 50–60 middorsal scales in one head length; distal portion of tail usually not conspicuously dark colored in front of pale colored tail tip; iris brown to reddish brown in life
 *Anolis gonavensis* sp. nov.
- 15b. 32–48 middorsal scales in one head length; distal portion of tail usually conspicuously dark colored in front of pale colored tail tip; iris color variable 16
- 16a. Iris pale blue to grayish blue in life; SVL of adult males 50–63 mm, of adult females 42–56 mm; the two median dorsal scale rows only slightly enlarged, usually less than twice the size of the adjacent scales; total number of loreal scales 15–30, mean 20.7
 *Anolis eladioi* sp. nov.
- 16b. Iris brown to reddish brown in life; SVL of adult males 37–45 mm, of adult females 35–43 mm; the two median dorsal scale rows distinctly enlarged, about twice the size of the adjacent scales; total number of loreal scales 14–20, mean 17.2 *Anolis prasinorius* sp. nov.

CLAVE PARA LAS ESPECIES DE *ANOLIS* VERDES DE LA HISPANIOLA

Nota: Esta clave incluye la especie introducida *Anolis porcatus* debido a su apariencia general similar a las especies tratadas en este trabajo.

- 1a. Escamas postmentales externas ampliamente agrandadas, más de cuatro veces el tamaño de las escamas mediales adyacentes; dorso con una raya vertebral crema a marrón pálida; saco gular de los machos rosado *Anolis porcatus*
- 1b. Escamas postmentales externas ligera a moderadamente agrandadas, menos de cuatro veces el tamaño de las escamas mediales adyacentes; dorso con o sin raya crema a marrón pálida; saco gular de los machos de alguna tonalidad de verde, amarillento, marrón, o azul 2
- 2a. Lamelas subdigitales en las Falanges II a IV del IV dedo de las patas posteriores >37 ; proporción de la longitud de la cola/LHC >1.7 , usualmente >2.0 ; generalmente el extremo de la cola no es de coloración conspicuamente oscura en relación a la punta pálidamente coloreada, si hay una porción oscuramente coloreada presente, entonces esta se encuentra en la zona de transición entre la porción central y distal 3
- 2b. Lamelas subdigitales en las Falanges II – IV del dedo IV de las patas posteriores <38 ; proporción de la longitud de la cola/LHC <1.7 ; porción distal de la cola generalmente de coloración conspicuamente oscura en relación a su extremo pálidamente coloreado 9
- 3a. Saco gular de los machos con doble hileras longitudinales u oblicuas de escamas gorgetales y no bicolorado (sin una porción posterior más oscura); 18–48, usualmente >28 escamas loreales en un máximo de 3–7 hileras; iris azul en vida 4
- 3b. Saco gular de los machos con escamas gorgetales mas o menos homogéneas, regularmente espaciadas y bicolorado con una porción posterior más oscura o no; 13–30, usualmente <28 escamas loreales en un máximo de 3–5 hileras; iris marrón o marrón rojizo en vida 8
- 4a. Una raya subocular blanca distintiva y una raya blanca lateral en el cuello presente; lados del cuerpo con un patrón de barras verticales verde pálido o manchas 5
- 4b. Sin raya subocular blanca y sin raya lateral blanca en el cuello; parte lateral del cuerpo usualmente sin un patrón de barras verticales verde pálido o manchas, si están presentes, mal definidas 7
- 5a. Escamas ventrales generalmente aquilladas; 4 o 5 supracaudales por segmento caudal
..... *Anolis coelestinus*
- 5b. Escamas ventrales usualmente lisas; 5 supracaudales por segmento caudal al menos en los cinco segmentos proximales 6
- 6a. Cola pálida con manchas y bandas distintivas; piel entre las escamas en la región temporal gris o blanco sucio; supralabiales e infralabiales relativamente altas, proporción alto de la primera supralabial/LHC <0.011 ; la cabeza sobresale menos, proporción ancho intercantal al punto medio de la distancia centro del ojo a narial/LHC <0.10 ; número total de escamas loreales 29–49, media 39.6 *Anolis chlorodius* sp. nov.
- 6b. Cola oscura y sin patrones distintivos; piel entre escamas en la región temporal negruzca; supralabiales e infralabiales relativamente altas, proporción alto de la primera supralabial/

LHC >0.011; la cabeza sobresale más, ancho de proporción intercantal en el punto medio de la distancia centro del ojo a narial / LHC >0.10; número total de escamas loreales 21–42, media 34.4 *Anolis viridius* sp. nov.

7a. Saco gular en vida verde amarillento a marrón amarillento; número total de escamas loreales 33–46, media 41.4 *Anolis pecuarius*

7b. Saco gular en vida gris a gris verdoso; número total de escamas loreales 30–35, media 32.5 *Anolis demissus*

8a. Manchas marrón pálido por encima y anteriores a los hombros, así como inmediatamente posterior al ojo; número total de escamas loreales 18–30; escamas ventrales usualmente ligera a débilmente aquilladas o con grupos de escamas aquilladas entre escamas, de otra manera escamas lisas ventrales; machos con saco gular con un patrón vermiculado en la porción anterior y sin una mancha negra en la porción posterior; hembras adultas sin rayas longitudinales en el cuerpo *Anolis cyanostictus*

8b. Sin manchas marrones por encima y anteriores al hombro así como inmediatamente posterior al ojo; número total de escamas loreales variable; escamas ventrales lisas o débilmente aquilladas; saco gular de los machos sin un patrón vermiculado en la porción anterior y con una cantidad variable de pigmento negro difuso en la porción posterior; hembras adultas con o sin rayas longitudinales en el cuerpo 9

9a. Escamas ventrales débilmente aquilladas; saco gular de los machos sin una difusión de pigmentos negros en la porción posterior *Anolis leucodera* sp. nov.

9b. Escamas ventrales lisas; saco gular de los machos con una difusión de pigmento negro en la porción posterior 10

10a. Una raya distintiva blanca subocular y una raya blanca en los laterales del cuello a menudo presente, más obvia en vida; piel en la porción posterior del saco gular de los machos negra con escamas gorgetales ampliamente separadas; machos adultos con un habitus robusto *Anolis peynadoi*

10b. Sin raya blanca supraorbital ni raya blanca en los lados del cuello; piel en la porción posterior del saco gular de los machos difusas con pigmentos negros, pero no enteramente negra, escamas gorgetales no conspicuamente espaciadas; machos adultos con habitus relativamente esbelto *Anolis chlorocyanus*

11a. 10–18 escamas loreales en 2–4 hileras; machos adultos con cola azul pálido a brillante en vida, o superficie dorsal completa del animal azul, capaz de rápida metacrosis a marrón; hembras adultas marrón grisáceas con una cola verdosa; escamas gorgetales centrales del saco gular de los machos cerca del mismo tamaño como aquellas en la porción posterior del saco gular *Anolis divius* sp. nov.

11b. 14–30, usualmente >15 escamas loreales en 3–4 hileras; machos y hembras adultos con una coloración general verde, capaces de metacrosis rápida a marrón; escamas gorgetales centrales del saco gular de los machos mas pequeñas que o subiguales a aquellas en la porción posterior del saco gular 12

- 12a. Una mancha axilar negra usualmente presente, el área anterior de esta mancha sin escamas y en vida difusa con o sin naranja 13
- 12b. Sin mancha axilar, el área anterior a esta mancha con escamas y no fuertemente difusa con naranja en vida 14
- 13a. Escamas en la superficie anterior del muslo no agrandadas o solo ligeramente, no más altas que largas *Anolis aliniger*
- 13b. Escamas sobre la superficie anterior del muslo conspicuamente agrandadas, mayormente más altas que largas *Anolis apletolepis* sp. nov.
- 14a. Escamas sublabiales acerca del mismo tamaño que las escamas mediales adyacentes a esta hilera; las dos hileras medianas de escamas distintivamente agrandadas, cerca del doble de tamaño de las escamas adyacentes *Anolis singularis*
- 14b. Escamas sublabiales mas grande que las escamas medianas adyacentes a ellas; las dos hileras de escamas medianas solo ligeramente agrandadas, usualmente menos que el doble de las escamas adyacentes 15
- 15a. 50–60 escamas mediodorsales en un largo de la cabeza; porción distal de la cola usualmente no conspicuamente coloreada oscura en relación del extremo de la cola pálido coloreado; iris marrón a rojizo en vida *Anolis gonavensis* sp. nov.
- 15b. 32–48 escamas mediodorsales en un segmento del largo de la cabeza; porción distal de la cola usualmente conspicuamente de coloración oscura en relación al color pálido del extremo de la cola; color del iris variable 16
- 16a. Iris azul pálido a azul grisáceo en vida; LHC de los machos adultos 50–63 mm, de las hembras 42–56 mm; las dos hileras de escamas medias dorsales solo ligeramente agrandadas, usualmente menos que el doble del tamaño de las escamas adyacentes; número total de escamas loreales 15–30, media 20.7 *Anolis eladioi* sp. nov.
- 16b. Iris marrón a marrón rojizo en vida; LHC de machos adultos 37–45 mm, de hembras adultas 35–43 mm; las dos hileras de escamas medias dorsales distintivamente agrandadas, acerca del doble del tamaño de las escamas adyacentes; número total de escamas loreales 14–20, media 17.2 *Anolis prasinorius* sp. nov.

DISCUSSION

During this study we encountered unexpected species diversity among the green anoles of Hispaniola. Instead of a small group of four species, we recognize 16 species and consider it likely that additional, undescribed, species are present. Obviously, the center of species diversity is on the South Island where 13 of the 16 recognized species occur. The primary species that are most likely to harbour additional, new species, are *Anolis aliniger* and *A. peynadoi*. Both are widely distributed and have isolated populations exhibiting genetic divergence (Fig. 6).

Most of the newly recognized species are allopatric, and therefore it might be questioned whether they are distinct species or just slightly differentiated populations. In the case of several (e.g., *Anolis gonavensis* versus other taxa, *A. coelestinus* versus *A. chlorodius* and *A. viridius*), large genetic distances (> 10%) at cytochrome b are sufficient in themselves to indicate species status, although they are well-differentiated morphologically, too. For *A. gonavensis*, occurrence in an unusual habitat (beach environment) further indicates it has diverged in habits. All of the species have dewlaps that differ from each other to some degree, and several species differ strikingly in body coloration (e.g., the blue-colored *A. divius*, and red nape spots in some individuals of *A. eladioi*). Even in species that have relatively low genetic divergence, we see independent evidence that they are biological species. For example, *A. aliniger* and *A. apletolepis* differ by only 6% at cytochrome b yet they are regionally sympatric in the Massif de la Selle (Haiti), with the former occurring on Morne D'Enfer and the latter occurring only 12 km away at Furey. In that case, individuals of *A. aliniger* at Morne D'Enfer are closer genetically to those 170 km away in the Cordillera Central of the Dominican Republic than they are to individuals only 12 km away in the Massif de la Selle (Fig. 6). Furthermore, *A. apletolepis* has enlarged thigh scales lacking in *A. aliniger*. Finally, there are other pairs of species that are sympatric or nearly so, including *A. cyanostictus* and *A. chlorocyanus*, *A. peynadoi* and *A. viridius*, and *A. leucodera* and *A. peynadoi*. For all of these reasons, we believe that these 16 taxa should be recognized at the species level.

García *et al.* (1994) suggested that hybridization among *Anolis chlorocyanus* (= *A. peynadoi*) and *A. coelestinus* (= *A. viridius*) occurred near the city of Barahona where these species are sympatric. Prompted by difficulties with identifying some individuals of green anoles, García *et al.* (1994) examined a suite of external characters and found individuals with supposedly intermediate characteristics. These authors indentified 14 out of 35 individuals as putative hybrids. However, the ranges of several of the investigated characters show considerable overlap between the two species and are therefore not useful to diagnose either species (e.g., number of scales between supraorbital semicircles; number of scales between interparietal and supraorbital semicircles; number of loreal scale rows). Other characters, such as the presence versus absence of the pale labial stripe, do occur in both species, as already pointed out by Mertens (1939). Also, *A. peynadoi* has a relatively robust habitus resembling that of *A. viridius* rather than of the more slender *A. chlorocyanus*. However, the two species can be positively differentiated by their strikingly different dewlap coloration and dewlap scalation and since all putative hybrids are reported to have had a bicolored dewlap, we assume that they all have to be referred to as *A. peynadoi*. Since hybridization has been documented between other species of anoles (e.g., Köhler *et al.*, 2010; Jezkova *et al.*, 2013), it might also occur among species of green anoles. But García *et al.* (1994) do not provide compelling evidence that this is actually the case. Furthermore, according to our molecular genetic evidence, *A. peynadoi* is closer related to the species of the *aliniger* species group than to the species of the *A. coelestinus* species group which includes *A. viridius*. Thus, it seems unlikely that hybridization to such an extent as suggested by García *et al.* (1994) would take place between rather distantly related species. More field and lab work is needed to evaluate whether hybridization occurs between species of Hispaniolan green anoles.

The hemipenes among the species treated in this contribution are rather similar in general morphology, varying from unlobed to slightly bilobed, and with some variation observed in surface ornamentation. However, this variation is very little compared to the massive differences in hemipenial morphology documented among Central American mainland beta anoles, where several extreme cases of hemipenial divergence concerning size and shape among very closely related and otherwise cryptic species have been documented (e.g., Köhler, 2009; Köhler *et al.*, 2010, 2012; Köhler, J. J. *et al.*, 2012; Köhler *et al.*, 2014). Our observations on hemipenis morphology in the alpha anoles studied here agrees with the findings of Lotzkat *et al.* (2013) for Central American mainland alpha anoles, both in the little amount of morphological variation and in the small size of the male copulatory organs relative to body size. Possibly, hemipenial morphology does not play an important role in speciation in alpha anoles as it seemingly does in beta anoles.

Historically, species of the *Anolis aliniger* species group (*A. aliniger* and *A. singularis*; and now five additional species) have been placed in the trunk-crown ecomorph (Williams, 1983). However, S. B. H. has noticed for many years that these species, especially the small ones, behave somewhat like twig anoles, at least in their night-time perches. Additional ecological study is needed to determine how these species behave when active and how they fit into the now much-refined ecomorph scheme (Losos, 2009).

Finally, the species relationships of the *chlorocyanus* series (Fig. 6) indicate that the deepest branches separate species occurring on the South Island, which suggests that the group evolved there and dispersed to the North Island. This is supported by molecular phylogenies (Nicholson *et al.*, 2005) showing that some of the closest relatives of the *chlorocyanus* series, the *hendersoni* and *monticola* series (Burnell & Hedges, 1990), also occur on the South Island. This raises a possible conundrum that the South Island is thought to be no older than 10 million years (My) old (Iturralde-Vinent & MacPhee, 1999), yet a fossil green anole from amber of the North Island (Rieppel, 1980) is no younger than 15 My old (Iturralde-Vinent & MacPhee, 1996). All of this is consistent if one assumes that an ancestral green anole lineage from the North Island invaded the South Island after it collided with the North Island about 10 My ago (Iturralde-Vinent & MacPhee, 1999), and then the North Island lineage went extinct and the South Island lineage re-invaded the North Island. Alternatively, the amber fossil anole may be unrelated to the *chlorocyanus* series. In either case, the current *chlorocyanus* series of 16 species is unquestionably a clade that has evolved and diversified primarily on the South Island of Hispaniola, presumably within the last 10 million years.

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