

## Catalogue of American Amphibians and Reptiles.

Ramos, Y.M. and R. Powell. 2001. *Anolis coelestinus*.

*Anolis coelestinus* Cope

*Anolis (Ctenocercus) coelestinus* Cope 1862:177. Type locality, "Near Jérémie [Département de la Grand' Anse Haiti]." Syntype, Museum of Comparative Zoology (MCZ-R) 3347 (but see **Remarks**), sex unknown, collected by Dr. Weinland, date of collection unknown (not examined by authors).

*Anolis chlorocyanus*: Barbour 1914:295 (part).

*Anolis latirostris* Schmidt 1919:521. Type-locality, "Navassa Island." Holotype, American Museum of Natural History (AMNH) 12598, male, collected by R.H. Beck July 13–19, 1919 (not examined by authors). See **Remarks**.

• **CONTENT.** Three subspecies are recognized: *coelestinus*, *demissus*, and *pecuarius*, but see **Remarks**.

• **DEFINITION.** *Anolis coelestinus* is a medium-sized green anole (maximum SVL in males to 84 mm, to 60 mm in females). Typical of a trunk-crown ecomorph (e.g., Williams 1983), the head and body are elongated and legs are short. The head scalation consists of (Schwartz and Henderson 1991): 4–7 rows of loreals, 1–3 scales between supraorbital semicircles, 2–6 scales between interparietal and supraorbital semicircles, 5 postrostrals, and 4 postmentals. The subocular scales are in contact with supralabials. The scales behind the interparietal grade gradually into dorsal scales. Dewlap scales are about the same size as ventrals. Supradigital scales multicarinate. The dorsal and flank scales are small, granular, subequal, and they become bigger middorsally. Ventral scales are hexagonal to square, subimbricate or juxtaposed, and smooth to slightly keeled. The tail is round and verticillate with 4–5 caudal scales verticillated dorsally. Ventral caudal scales are large and strongly keeled.

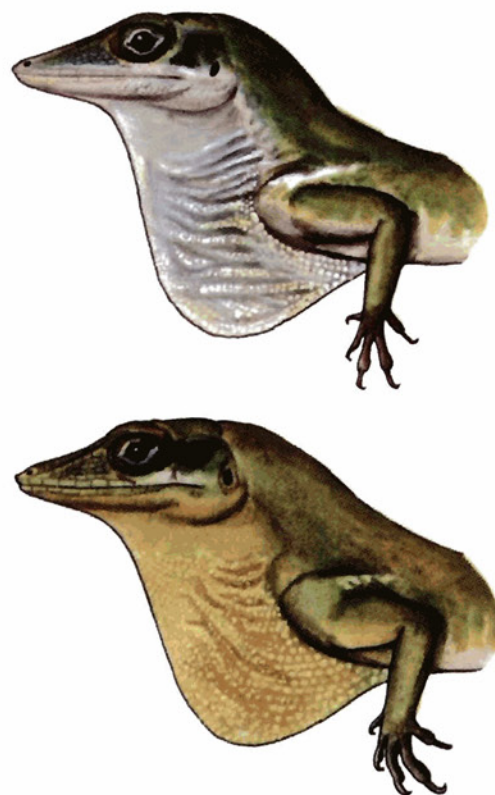
Dorsal color is pale or bright green, or yellow-green to brown or olive-brown. Ventral color is pale yellow-green, or pale greenish gray to brown. The eye skin is sooty black at times and the eye-ring is pale blue or yellowish. A black to dark blue postocular spot and a gray-green shoulder spot are present. The sides of the neck and body have many vertical reticulations and spots that differ between populations. A wide white or tan stripe, present or absent by subspecies, runs from below the eye under the auricular opening and over the shoulder to the axilla. The throat skin is very bright yellow-green. Dewlap color is variable and can be dark yellowish brown, gray, dark gray, greenish gray, blue-gray, pale bluish, brown, yellowish green, or greenish yellow. Dewlap scales are bright yellow to pale yellow or whitish.

• **DESCRIPTIONS.** In addition to the original descriptions by Cope (1862) and Schwartz (1969), detailed descriptions may be found in Cochran (1941), Williams (1965), and Schwartz and Henderson (1991). Gorman et al. (1967) described the karyotype (2N = 36; 12 macrochromosomes and 24 microchromosomes).

• **ILLUSTRATIONS.** Illustrations are in Schmidt (1921, top of head; as *Anolis latirostris*), Cochran (1941, head, tail, and middorsal scales), Williams (1965, dewlap scales and top of head), Schwartz and Henderson (1985, colored drawings of head and extended dewlap in *A. c. coelestinus* and *A. c. pecuarius*), and Olson (1990, three views of the head, skull, and toe).



**FIGURE 1.** Adult male *Anolis coelestinus coelestinus* from Barahona (top; photograph courtesy of Donald D. Smith) and from Loma Remigio in the Sierra de Baoruco Oriental. Both localities are in the Provincia de Barahona, República Dominicana.

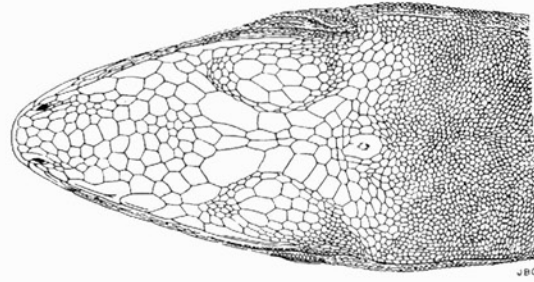


**FIGURE 2.** Adult male *Anolis coelestinus coelestinus* (top) from "Haiti: l'Ouest: Morne Calvaire, 1 mi. SW Pétienville (ASFS X1281)" and an adult male *A. c. pecuarius* from "Haiti: Ile-à-Vache, western end (ASFS X3724)" (from Schwartz and Henderson 1985).

• **DISTRIBUTION.** A Hispaniolan endemic, the species is found in a variety of mesic to moderately xeric habitats throughout the South Paleoisland and on Île Grande Cayemite and Île-à-Vache. Although native to the South Paleoisland (Schwartz 1980, Powell et al. 1999), it is sympatric with its North Island counterpart, *A. chlorocyanus*, in at least two locations (Williams 1965; Schwartz 1969, 1980; Powell et al. 1991; Garcia et al. 1994). The Hispaniolan range was previously illustrated by Williams (1965) and Schwartz and Henderson (1991).

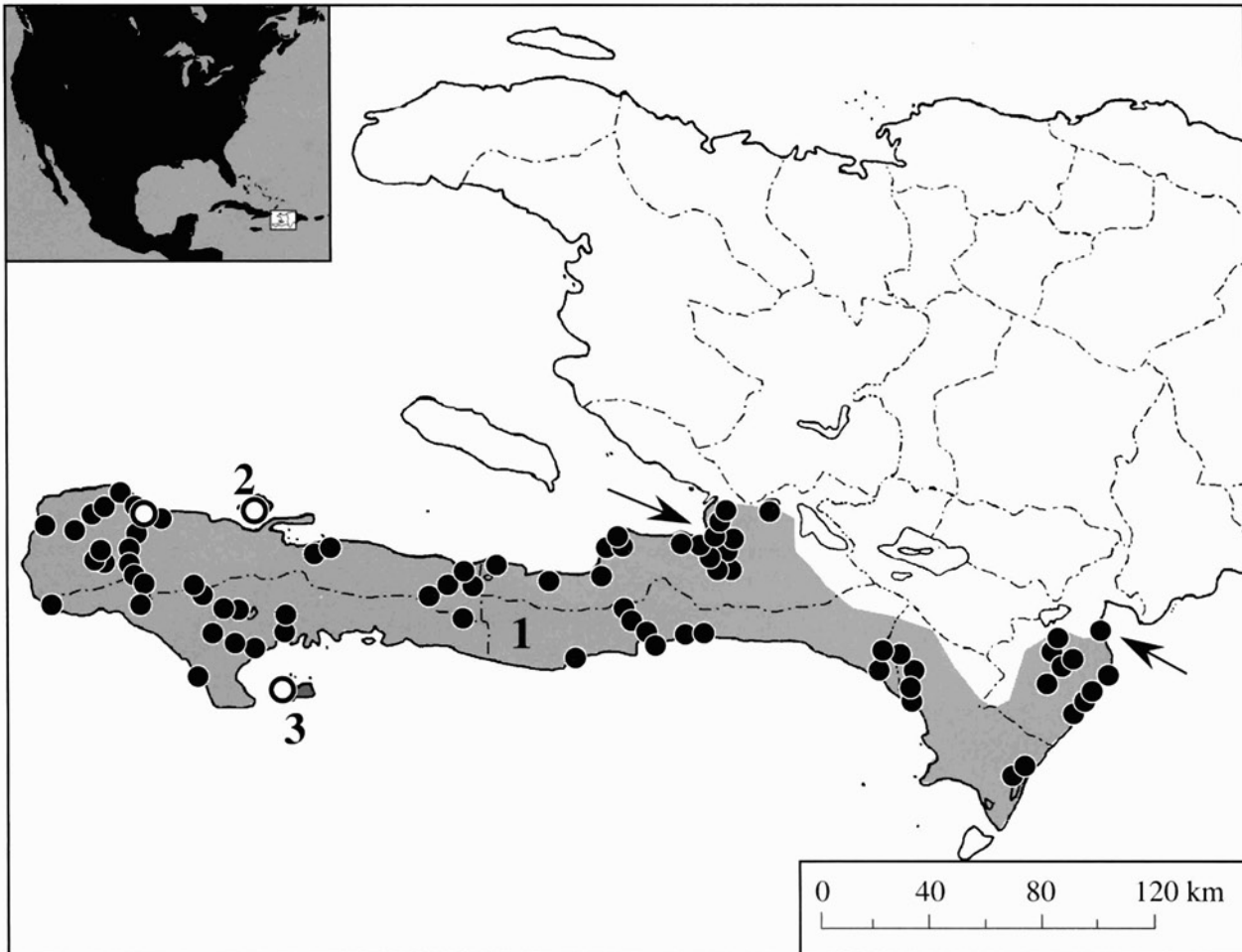
• **FOSSIL RECORD.** Two fossil specimens found in Hispaniolan amber are thought to belong to the *Anolis chlorocyanus* species group of which *A. coelestinus* is a member (Rieppel 1980, de Queiroz et al. 1998). One of the specimens, *A. dominicanus*, appears to be closely related to *A. coelestinus*.

• **PERTINENT LITERATURE.** References to *Anolis coelestinus* are arranged by topic: **behavior** (Mertens 1946; Garcea and Gorman 1968; Carpenter and Ferguson 1977; Milton and Jensen 1979; Moermond 1979a, b, 1981; Greene 1988; Gerber 1999; Schneider et al. 2000), **comparative morphology** (general: Williams 1960, 1965; body size: Schoener 1969, 1970, 1988, Fitch 1981; pterygoid teeth: Williams and Rand 1969; neural spines: Forsgaard 1983; rectus abdominis muscle complex: Moody 1983; subdigital lamellae: Glossip and Losos 1997), **ecomorphology** (Williams 1983, Moermond 1986, Schoener 1988, Irschick et al. 1997, Jackman et al. 1997, Losos



**FIGURE 3.** Adult male *Anolis coelestinus coelestinus* (MCZ 74708) from Pourcine, Massif de la Hotte, Haiti (from Williams 1965).

and de Queiroz 1997, Beuttell and Losos 1999), **habitat** (Williams 1972, SEA/DVS 1990, Lenart and Sowell 1996, Lenart et al. 1997), **husbandry** (Fläschendräger and Wijffels 1996), **hybridization with *A. chlorocyanus*** (Garcia et al. 1994; also see **Comment**), **natural history** (Moermond 1983, Bowersox et al. 1994, Howard et al. 1999, Cast et al. 2000, Henderson and Powell 2001, Sifers et al. 2001), **parapatry with *A. chlorocyanus*** (Williams 1972), **parasites** (lack of saurian malaria: Telford 1975; helminths: Goldberg et al. 1996; mites: Zippel et al. 1996), **predation** (Henderson et al. 1987, 1988), **reproduction** (Smith et al. 1972 [1973]), **sexual size dimorphism and habitat** (Butler et al. 2000), **sympatry with *A. chlorocyanus*** (Williams 1965; Schwartz 1969, 1980; Powell



**MAP.** Distribution of *Anolis coelestinus* (modified from Schwartz and Henderson, 1991). Large circles mark the type localities, dots indicate other records (many representing multiple specimens and several proximate localities), and the arrows denote areas of sympatry with *A. chlorocyanus* (see **Distribution**).

et al. 1991; Garcia et al. 1994), **systematics** (Etheridge 1960; Williams 1965, 1976; Burnell and Hedges 1990; Poe 1998, 1999; Jackman et al. 1997, 1999).

This species is included in **guides, checklists, and notes** (some of which may include brief descriptions) by Cope (1879), Garman (1887 [1888]), Barbour (1914, 1930a, b, 1935, 1937), Schmidt (1921, as *Anolis latirostris*), Barbour and Loveridge (1929), Cochran (1928, 1934, 1941), Mertens (1939, 1946), Williams (1960, 1963, 1969, 1976, 1977), Williams and Rand (1969), Schwartz and Thomas (1975), MacLean et al. (1977), Moermond (1978), Schwartz (1980), Henderson and Schwartz (1984), Henderson et al. (1984), Schwartz and Henderson (1985, 1988), Fitch and Henderson (1987), O'Hare and Williams (1994, see also Williams et al. 1995), Olson (1990), SEA/DVS (1990, 1992), Frank and Ramus (1995), Fläschendräger and Wijffels (1996), Irschick and Losos (1996), Irschick et al. (1997), Powell (1999), and Powell et al. (1996, 1999).

• **REMARKS.** Cope (1862) listed MCZ 1500 as the holotype, but Schwartz and Thomas (1975) and others have noted correctly that the "syntype" was MCZ 3347 and that others could not be found. José Rosado (in litt., 24.IV.00) described "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, because no collection dates are entered, a syntype certainly could have been received after its description.

The name *Anolis latirostris* was based on a single damaged specimen. Thomas (1966) concluded that the specimen was an *A. coelestinus*, most likely collected in the region of Les Cayes, Haiti, and mistakenly labeled as being from Navassa Island.

Etheridge (1960) recognized an *A. coelestinus* series distinct from the *A. carolinensis* series in which *A. coelestinus* is generally placed. His *A. coelestinus* series consisted solely of *A. coelestinus* and *A. latirostris*.

Powell (1993) included both satellite island forms, *Anolis coelestinus demissus* and *A. c. pecuarius*, among Hispaniolan subspecies that might warrant recognition as full species.

• **ETYMOLOGY.** The name *coelestinus* is derived from the Greek *koilos*, meaning hollow, and the Greek *steinos*, meaning narrow, presumably in reference to the small concavity of the front of the head. The name *demissus* is derived from the Latin, meaning depressed or low, probably in reference to the fact that the type locality is near sea level (R. Thomas, in litt., 08.X.99). The name *pecuarius* is derived from the Latin *pecus*, meaning cow, and *arius*, meaning pertaining to, in reference to the distribution on Île-à-Vache.

• **COMMENT.** In the area of hybridization with *Anolis chlorocyanus* in Barahona, República Dominicana, males and females of both species responded with equal alacrity to the proximity of members of either species. Also, despite expectations that character displacement should enhance differences in display patterns, distinctions noted by Garcea and Gorman (1968) were, if anything, less obvious than was indicated in their preliminary study (R. Garcia, unpubl. data).

### 1. *Anolis coelestinus coelestinus* Cope

*Anolis (Ctenocercus) coelestinus* Cope 1862:177. See species synonymy.

*Anolis chlorocyanus*: Barbour 1914:295 (part). See species synonymy.

*Anolis latirostris* Schmidt 1919:521. See species synonymy; also see **Remarks**.

*Anolis coelestinus coelestinus* Schwartz 1969:34. First use of trinomial.



**FIGURE 4.** Copulating *Anolis coelestinus coelestinus* from Barahona, Provincia de Barahona, República Dominicana (photograph courtesy of Alejandro Queral).

• **DIAGNOSIS.** This subspecies is defined by the following combination of characters: white labial to shoulder stripe present; dewlap skin gray, blue, or greenish yellow; and vertical white lateral bars or vermiculations on the lower sides.

### 2. *Anolis coelestinus demissus* Schwartz

*Anolis coelestinus demissus* Schwartz 1969:35. Type locality, "vicinity of Pointe Sable, Ile Grande Cayemite, Haiti." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 92049, an adult male, collected 18 March 1966 by R. Thomas (not examined by authors).

• **DIAGNOSIS.** This subspecies is defined by the following combination of characters: white labial to shoulder stripe absent, dewlap dark gray to greenish gray, and no lateral body pattern.

### 3. *Anolis coelestinus pecuarius* Schwartz

*Anolis coelestinus pecuarius* Schwartz 1969:34. Type locality, "western end, Ile-à-Vache, Haiti." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 81141, an adult male, collected 6 August 1962 by R.F. Klinikowski (not examined by authors).

• **DIAGNOSIS.** This subspecies is defined by the following combination of characters: white labial to shoulder stripe absent, dewlap skin yellowish brown, and no lateral body pattern.

• **ACKNOWLEDGEMENTS.** José Rosado, Museum of Comparative Zoology, Harvard University, helped clarify the confusion over the holotype of *Anolis coelestinus*. Kraig Adler graciously provided access to his extensive library, and Robert W. Henderson helped secure some difficult references.

### LITERATURE CITED

Barbour, T. 1914. A contribution to the zoögeography of the West Indies, with especial reference to amphibians and reptiles. Mem. Mus. Comp.

- Zoöl. 44:209–359 + 1 pl.
- , 1930a. A list of Antillean reptiles and amphibians. *Zoologica* (N.Y.) 11:61–116.
- , 1930b. The anoles I: The forms known to occur in the Neotropical islands. *Bull. Mus. Comp. Zoöl.* 70:105–144.
- , 1935. A second list of Antillean reptiles and amphibians. *Zoologica* (N.Y.) 19:77–141.
- , 1937. Third list of Antillean reptiles and amphibians. *Bull. Mus. Comp. Zoöl.* 82:77–166.
- and A. Loveridge. 1929. Typical reptiles and amphibians. *Bull. Mus. Comp. Zoöl.* 69:205–360.
- Beuttell, K. and J.B. Losos. 1999. Ecological morphology of Caribbean anoles. *Herpetol. Monogr.* 13:1–28.
- Bowersox, S.R., S. Calderón, C. Cisneros, R.S. Garcia, C. Huntington, A. Lathrop, L. Lenart, J.S. Parmelee, Jr., R. Powell, A. Queral, D.D. Smith, S.P. Sowell, and K.C. Zippel. 1994. Miscellaneous natural history notes on amphibians and reptiles from the Dominican Republic. *Bull. Chicago Herpetol. Soc.* 29:54–55.
- Burnell, K.L. and S.B. Hedges. 1990. Relationships of West Indian *Anolis* (Sauria: Iguanidae): an approach using slow-evolving protein loci. *Carib. J. Sci.* 26:7–30.
- Butler, M.A., T.W. Schoener, and J.B. Losos. 2000. The relationship between sexual size dimorphism and habitat use in Greater Antillean *Anolis* lizards. *Evolution* 54:259–272.
- Carpenter, C.C. and G.W. Ferguson. 1977. Variation and evolution of stereotyped behavior in reptiles, p. 335–554. *In* C.Gans and D.W. Tinkle (eds.), *Biology of the Reptilia*. Vol. 7. Ecology and Behaviour A. Academic Press, London, New York, San Francisco.
- Cast, E.E., M.E. Gifford, K.R. Schneider, A.J. Hardwick, John Parmelee, Jr., Robert Powell. 2000. Natural history of an anoline lizard community in the Sierra de Baoruco, Hispaniola. *Carib. J. Sci.* 36:258–266.
- Cochran, D.M. 1928. The herpetological collections made in Haiti and its adjoining islands by Walter J. Eyerdam. *Proc. Biol. Soc. Washington* 41:53–60.
- , 1934. Herpetological collections made in Hispaniola by the *Utowana* Expedition, 1934. *Occ. Pap. Boston Soc. Nat. Hist.* 8:163–188.
- , 1941. The herpetology of Hispaniola. *U.S. Natl. Mus. Bull.* (177):vii + 398 p.
- Cope, E.D. 1862. Contributions to Neotropical saurology. *Proc. Acad. Nat. Sci. Philadelphia* 1862:176–188.
- , 1879. Eleventh Contribution to the Herpetology of Tropical America. *Proc. Amer. Phil. Soc.* 18:261–277.
- de Queiroz, K., L.-R. Chu, and J.B. Losos. 1998. A second *Anolis* lizard in Dominican amber and the systematics and ecological morphology of Dominican amber anoles. *Amer. Mus. Novitates* (3249):1–23.
- Etheridge, R. 1960. The relationships of the anoles (Reptilia: Sauria: Iguanidae): an interpretation based on skeletal morphology. Unpubl. Ph.D. Diss., Univ. Michigan, Ann Arbor.
- Fitch, H.S. 1981. Sexual size differences in reptiles. *Misc. Publ. Mus. Nat. Hist. Univ. Kansas* (70):1–72.
- and R.W. Henderson. 1987. Ecological and ethological parameters in *Anolis bahorucoensis*, a species having rudimentary development of the dewlap. *Amphib.-Rept.* 8:69–80.
- Fläschendräger, A. and L. Wijffels. 1996. *Anolis* in Biotop und Terrarium. Natur und Tier Verlag, Matthias Schmidt, Münster.
- Forsgaard, K. 1983. The axial skeleton of *Chamaelinorops*, p. 284–295. *In* A.G.J. Rhodin and K. Miyata (eds.), *Advances in Herpetology and Evolutionary Biology. Essays in Honor of Ernest E. Williams*. Mus. Comp. Zool., Cambridge, Massachusetts.
- Frank, N. and E. Ramus. 1995. *A Complete Guide to Scientific and Common Names of Reptiles and Amphibians of the World*. NG Publ., Inc., Pottsville, Pennsylvania.
- Garcea, R. and G. Gorman. 1968. A difference in male territorial display behavior in two sibling species of *Anolis*. *Copeia* 1968:419–420.
- Garcia, R., A. Queral, R. Powell, J.S. Parmelee, Jr., D.D. Smith, and A. Lathrop. 1994. Evidence of hybridization among green anoles (Lacertilia: Polychrotidae) from Hispaniola. *Carib. J. Sci.* 30:279–281.
- Garman, S. 1887 [1888]. On West Indian reptiles. Iguanidae. *Bull. Essex Inst.* 19:25–50.
- Gerber, G.P. 1999. A review of intraguild predation and cannibalism in *Anolis*, p. 28–39. *In* J.B. Losos and M. Leal (eds.), *Anolis Newsletter* V. Washington Univ., St. Louis, Missouri.
- Glossip, D. and J.B. Losos. 1997. Ecological correlates of number of subdigital lamellae in anoles. *Herpetologica* 53:192–199.
- Goldberg, S.R., C.R. Bursey, and H. Cheam. 1996. Gastrointestinal helminths of six anole species, *Anolis armouri*, *A. barahonae*, *A. bahorucoensis*, *A. brevirostris*, *A. chlorocyanus* and *A. coelestinus* (Polychrotidae) from Hispaniola. *Carib. J. Sci.* 32:112–115.
- Gorman, G.C., L. Atkins, and T. Holzinger. 1967. New karyotypic data on 15 genera of lizards in the family Iguanidae, with a discussion of taxonomic and cytological implications. *Cytogenetics* 6:286–299.
- Greene, H.W. 1988. Antipredator mechanisms in reptiles, p. 1–152. *In* C. Gans and R.B. Huey (eds.), *Biology of the Reptilia*. Vol. 16, Ecology B. Defense and Life History. Alan R. Liss, Inc., New York.
- Henderson, R.W., T.A. Noeske-Hallin, B.I. Crother, and A. Schwartz. 1988. The diets of Hispaniolan colubrid snakes II. Prey species, prey size, and phylogeny. *Herpetologica* 44:55–70.
- and R. Powell. 2001. Responses by the West Indian herpetofauna to human-influenced resources. *Carib. J. Sci.* 37: in press.
- and A. Schwartz. 1984. A guide to the identification of the amphibians and reptiles of Hispaniola. *Milwaukee Publ. Mus. Spec. Publ. Biol. Geol.* (4):1–70.
- , —, and S.J. Incháustegui. 1984. Guía para la indentificación de los anfibios y reptiles de la Hispaniola. *Mus. Nac. Hist. Nat. Ser. Mono.* (1):1–128.
- , —, and T.A. Noeske-Hallin. 1987. Food habits of three colubrid tree snakes (genus *Uromacer*) on Hispaniola. *Herpetologica* 43:241–248.
- Howard, A.K., J.D. Forester, J.M. Ruder, J.S. Parmelee, Jr., and R. Powell. 1999. Natural history of a terrestrial Hispaniolan anole: *Anolis barbouri*. *J. Herpetol.* 33:702–706.
- Irschick, D.J. and J.B. Losos. 1996. Morphology, ecology, and behavior of the twig anole, *Anolis angusticeps*, p. 291–301. *In* R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol., vol. 12, Ithaca, New York.
- , L.J. Vitt, P.A. Zani, and J.B. Losos. 1997. A comparison of evolutionary radiations in mainland and Caribbean *Anolis* lizards. *Ecology* 78:2191–2203.
- Jackman, T.R., A. Larson, K. de Queiroz, and J.B. Losos. 1999. Phylogenetic relationships and tempo of early diversification in *Anolis* lizards. *Syst. Biol.* 48:254–285.
- , J.B. Losos, A. Larson, and K. de Queiroz. 1997. Phylogenetic studies of convergent adaptive radiations in Caribbean *Anolis* lizards, p. 535–557. *In* T.J. Givnish and K.J. Sytsma (eds.), *Molecular Evolution and Adaptive Radiation*. Cambridge Univ. Press, Oxford.
- Lenart, L.A., R. Powell, J.S. Parmelee, Jr., A. Lathrop, and D.D. Smith. 1997. Anoline diversity in three differentially altered habitats in the Sierra de Baoruco, Republica Dominicana. *Hispaniola. Biotropica* 29:117–123.
- and S.P. Sowell. 1996. Anoline diversity in three differentially altered habitats in the Sierra de Baoruco, Dominican Republic, Hispaniola (abstracts in English, Spanish, and French), p. 442–443. *In* R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol. (12), Ithaca, New York.
- Losos, J.B. and K. de Queiroz. 1997. Evolutionary consequences of ecological release in Caribbean *Anolis* lizards. *Biol. J. Linn. Soc.* 61: 459–483.
- MacLean, W.P., R. Kellner, and H. Dennis. 1977. Island lists of West Indian amphibians and reptiles. *Smithson. Herpetol. Info. Serv.* (40): 1–47.
- Mertens, R. 1939. Herpetologische Ergebnisse einer Reise nach der Insel Hispaniola, Westindien. *Abh. Senckenberg. Naturf. Ges.* (449):1–84 + 10 pl.
- , 1946. Die Warn- und Droh-Reaktionen der Reptilien. *Abh. Senckenberg. Naturf. Ges.* 47:1–108 + 8 pl.
- Milton, T.H. and T.A. Jenssen. 1979. Description and significance of vocalizations by *Anolis grahami* (Sauria: Iguanidae). *Copeia* 1979: 481–489.
- Moermond, T.C. 1978. Complex color changes in *Anolis* (Reptilia, Lacertilia, Iguanidae). *J. Herpetol.* 12:319–325.
- , 1979a. Habitat constraints on the behavior, morphology, and community structure of *Anolis* lizards. *Ecology* 60:152–164.
- , 1979b. The influence of habitat structure on *Anolis* foraging behavior. *Behaviour* 70:147–167.
- , 1981. Prey-attack behavior of *Anolis* lizards. *Z. Tierpsychol.* 56:128–136.
- , 1983. Competition between *Anolis* and birds: a reassessment, p.

- 507–520. In A.G.J. Rhodin and K. Miyata (eds.), *Advances in Herpetology and Evolutionary Biology. Essays in Honor of Ernest E. Williams*. Mus. Comp. Zool., Cambridge, Massachusetts.
- . 1986. A mechanistic approach to the structure of animal communities: *Anolis* lizards and birds. *Amer. Zool.* 26:23–37.
- Moody, S.M. 1983. The rectus abdominis muscle complex of the Lacertilia: terminology, homology, and assumed presence in primitive iguanian lizards, p. 195–212. In A.G.J. Rhodin and K. Miyata (eds.), *Advances in Herpetology and Evolutionary Biology. Essays in Honor of Ernest E. Williams*. Mus. Comp. Zool., Cambridge, Massachusetts.
- O'Hare, R.J. and E.E. Williams. 1994. The *Anolis* Handlist. Hypercard document, Mus. Comp. Zool., Harvard Univ., Cambridge, Massachusetts.
- Olson, R.E. 1990. Herpetological observations on Tiburon Peninsula, Haiti, West Indies. *Bull. Maryland Herpetol. Soc.* 26:135–152.
- Poe, S. 1998. Skull characters and the cladistic relationships of the Hispaniolan dwarf twig *Anolis*. *Herpetol. Monogr.* (12):192–236.
- . 1999. p. 99–104. In J.B. Losos and M. Leal (eds.), *Anolis Newsletter V*. Washington Univ., St. Louis, Missouri.
- Powell, R. 1993. Comments on the taxonomic arrangement of some Hispaniolan amphibians and reptiles. *Herpetol. Rev.* 24:135–137.
- . 1999. Natural history of some *Anolis* lizards: a summary of work in the last decade, p. 105–109. In J.B. Losos and M. Leal (eds.), *Anolis Newsletter V*. Washington Univ., St. Louis, Missouri.
- , R.W. Henderson, K. Adler, and H.A. Dundee. 1996. An annotated checklist of West Indian amphibians and reptiles, p. 51–93 + 8 pl. In R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol. (12), Ithaca, New York.
- , J.A. Ottenwalder, and S.J. Incháustegui. 1999. The Hispaniolan herpetofauna: diversity, endemism, and historical perspectives, with comments on Navassa Island, p. 93–168. In B.I. Crother (ed.), *Caribbean Amphibians and Reptiles*. Academic Press, San Diego.
- , J.S. Parmerlee, Jr., D.D. Smith, and A. Lathrop. 1991. Geographic distribution. *Anolis chlorocyanus*. *Herpetol. Rev.* 22:134.
- Rieppel, O. 1980. Green anole in Dominican amber. *Nature* 286:486–487.
- Schoener, T.W. 1969. Size patterns in West Indian *Anolis* lizards: I. Size and species diversity. *Syst. Zool.* 18:386–401.
- . 1970. Size patterns in West Indian *Anolis* lizards: II. Correlations with the sizes of particular sympatric species—displacement and convergence. *Am. Nat.* 104:155–174.
- . 1988. Testing for non-randomness in sizes and habitats of West Indian lizards: choice of species pool affects conclusions from null models. *Evol. Ecol.* 2:1–26.
- Schmidt, K.P. 1919. Descriptions of new amphibians and reptiles from Santo Domingo and Navassa. *Bull. Amer. Mus. Nat. Hist.* 41:519–525.
- . 1921. The herpetology of Navassa Island. *Bull. Amer. Mus. Nat. Hist.* 44:555–559.
- Schneider, K.R., J.S. Parmerlee, Jr., and R. Powell. 2000. Escape behavior of *Anolis* lizards from the Sierra de Baoruco, Hispaniola. *Carib. J. Sci.* 36: 321–323.
- Schwartz, A. 1969. A review of the Hispaniolan lizard *Anolis coelestinus* Cope. *Carib. J. Sci.* 9:33–38.
- . 1980. The herpetogeography of Hispaniola, West Indies. *Stud. Fauna Curaçao Carib. Isl.* 61:86–127.
- and R.W. Henderson. 1985. A guide to the identification of the amphibians and reptiles of the West Indies exclusive of Hispaniola. Milwaukee Publ. Mus., Milwaukee, Wisconsin.
- and —. 1988. West Indian amphibians and reptiles: a check-list. *Milwaukee Pub. Mus. Contr. Biol. Geol.* (74):1–264.
- and —. 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. Univ. Florida Press, Gainesville.
- and R. Thomas. 1975. A check-list of West Indian amphibians and reptiles. *Carnegie Mus. Nat. Hist. Spec. Publ.* (1):1–216.
- SEA/DVS (Secretaría de Estado de Agricultura/Departamento de Vida Silvestre). 1990. La diversidad biológica en la República Dominicana: reporte preparado por el Departamento de Vida Silvestre para el Servicio Alemán de Cooperación Social-Técnica y Fondo Mundial para la Naturaleza (WWD-US). Apéndice. Sec. Estado Agric., SURENA/DVS. Sto. Domingo, República Dominicana.
- . 1992. Reconocimiento y evaluación de los recursos naturales en el Bahoruco Oriental. Sec. Estado Agric., Depto. Vida Silvestre. Sto. Domingo, República Dominicana.
- Sifers, S.M., M.L. Yeska, Y.M. Ramos, R. Powell, and J.S. Parmerlee, Jr. 2001. *Anolis* lizards restricted to altered edge habitats in a Hispaniolan cloud forest. *Carib. J. Sci.* 37: in press.
- Smith, H.M., G. Sinelnik, J.D. Fawcett, and R.E. Jones. 1972 (1973). A survey of the chronology of ovulation in anoline lizard genera. *Trans. Kansas Acad. Sci.* 75:107–120.
- Telford, S.R., Jr. 1975. Saurian malaria in the Caribbean: *Plasmodium azurophilum* sp. Nov., a malarial parasite with schizogony and gametogony in both red and white blood cells. *Intl. J. Parasitol.* 5:383–394.
- Thomas, R. 1966. A reassessment of the herpetofauna of Navassa island. *J. Ohio Herpetol. Soc.* 5:73–89.
- Williams, E.E. 1960. Notes on Hispaniolan herpetology 1. *Anolis christophei*, new species, from the citadel of King Christophe, Haiti. *Breviora* (117):1–7.
- . 1963. Notes on Hispaniolan Herpetology 8. The forms related to *Anolis hendersoni* Cochran. *Breviora* (186):1–13.
- . 1965. The species of Hispaniolan green anoles (Sauria, Iguanidae). *Breviora* (227):1–16.
- . 1969. The ecology of colonization as seen in the zoogeography of anoline lizards on small islands. *Quart. Rev. Biol.* 44:345–389.
- . 1972. The origin of faunas. Evolution of lizard congeners in a complex island fauna: a trial analysis, p. 47–89. In T. Dobzhansky, M.K. Hecht, and W.C. Steere (eds.), *Evolutionary Biology*, Vol. 6. Appleton-Century-Crofts, New York.
- . 1976. West Indian anoles: a taxonomic and evolutionary summary I. Introduction and a species list. *Breviora* (440):1–21.
- . 1977. Species problems, p. 132–151. In E.E. Williams (ed.), *The Third Anolis Newsletter*. Mus. Comp. Zool., Cambridge Massachusetts.
- . 1983. Ecomorphs, faunas, island size, and diverse end points in island radiations of *Anolis*, p. 326–370. In R.B. Huey, E.R. Pianka, and T.S. Schoener (eds.), *Lizard Ecology. Studies of a Model Organism*. Harvard Univ. Press, Cambridge, Massachusetts.
- and A.S. Rand. 1969. *Anolis insolitus*, a new dwarf anole of zoogeographic importance from the mountains of the Dominican Republic. *Breviora* (326):1–21.
- , H. Rand, A.S. Rand, and R.J. O'Hare. 1995. A computer approach to the comparison and identification of species in difficult taxonomic groups. *Breviora* (502):1–47.
- Zippel, K.C., R. Powell, J.S. Parmerlee, Jr., S. Monks, A. Lathrop, and D.D. Smith. 1996. The distribution of larval *Eutrombicula alfreddugesi* (Acari: Trombiculidae) infesting *Anolis* lizards (Lacertilia: Polychrotidae) from different habitats on Hispaniola. *Carib. J. Sci.* 32:43–49.

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