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A new skink fauna from Caribbean islands (Squamata, Mabuyidae, Mabuyinae)

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Abstract

Neotropical skinks are unique among lizards and other vertebrates in their degree of convergence, in reproductive traits, with eutherian mammals. They have also been famously difficult to classify into species, largely because of a conservative body plan and paucity of conventional diagnostic characters. Currently there are 26 recognized species, six of which occur only on Caribbean islands. All are placed in a single genus, *Mabuya*. We conducted a systematic revision of Neotropical skinks using both conventional and unconventional morphological characters, supplemented by DNA sequence analyses. We define 61 species grouped into 16 clades, recognized here as genera. They include three available generic names (*Copeoglossum*, *Mabuya*, and *Spondylurus*) and 13 new genera: *Alinea* **gen. nov.**, *Aspronema* **gen. nov.**, *Brasiliscincus* **gen. nov.**, *Capitellum* **gen. nov.**, *Exila* **gen. nov.**, *Manciola* **gen. nov.**, *Maracaiba* **gen. nov.**, *Marisora* **gen. nov.**, *Notomabuya* **gen. nov.**, *Orosaura* **gen. nov.**, *Panopa* **gen. nov.**, *Psychosaura* **gen. nov.**, and *Varzea* **gen. nov.** These 16 genera of skinks form a monophyletic group and are placed in the Subfamily Mabuyinae of the skink Family Mabuyidae. Six other skink families are recognized: Acontidae, Egerniidae, Eugongylidae, Lygosomidae, Scincidae, and Sphenomorphidae. We describe three new subfamilies of Mabuyidae: Chioniniinae **subfam. nov.**, Dasiinae **subfam. nov.**, and Trachylepidinae **subfam. nov.** We describe 24 new species of mabuyines: *Capitellum mariagalantae* **sp. nov.**, *Capitellum parvicruzae* **sp. nov.**, *Copeoglossum aurae* **sp. nov.**, *Copeoglossum margaritae* **sp. nov.**, *Copeoglossum redondae* **sp. nov.**, *Mabuya cochonae* **sp. nov.**, *Mabuya desiradae* **sp. nov.**, *Mabuya grandisterrae* **sp. nov.**, *Mabuya guadeloupae* **sp. nov.**, *Mabuya hispaniolae* **sp. nov.**, *Mabuya montserratae* **sp. nov.**, *Marisora aurulae* **sp. nov.**, *Marisora magnacornae* **sp. nov.**, *Marisora roatanae* **sp. nov.**, *Spondylurus anegadae* **sp. nov.**, *Spondylurus culebrae* **sp. nov.**, *Spondylurus caicosae* **sp. nov.**, *Spondylurus haitiae* **sp. nov.**, *Spondylurus magnacruzae* **sp. nov.**, *Spondylurus martinae* **sp. nov.**, *Spondylurus monae* **sp. nov.**, *Spondylurus monitae* **sp. nov.**, *Spondylurus powelli* **sp. nov.**, and *Spondylurus turksae* **sp. nov.** We also resurrect 10 species from synonymies: *Alinea lanceolata* **comb. nov.**, *Alinea luciae* **comb. nov.**, *Capitellum metallicum* comb. nov., *Mabuya dominicana*, *Marisora alliacea* **comb. nov.**, *Marisora brachypoda* **comb. nov.**, *Spondylurus fulgidus* **comb. nov.**, *Spondylurus nitidus* **comb. nov.**, *Spondylurus semitaeniatus* **comb. nov.**, and *Spondylurus spilonotus* **comb. nov.** Of the 61 total species of mabuyine skinks, 39 occur on Caribbean islands, 38 are endemic to those islands, and 33 of those occur in the West Indies. Most species on Caribbean islands are allopatric, single-island endemics, although three species are known from Hispaniola, three from St. Thomas, and two from Culebra, St. Croix, Salt Island, Martinique, the southern Lesser Antilles, Trinidad, and Tobago. Co-occurring species typically differ in body size and belong to different genera. Three ecomorphs are described to account for associations of ecology and morphology: terrestrial, scansorial, and cryptozoic. Parturition occurs at the transition between the dry and wet seasons, and the number of young (1–7) is correlated with body size and taxonomic group. Molecular phylogenies indicate the presence of many unnamed species in Middle and South America. A molecular timetree shows that mabuyines dispersed from Africa to South America 18 (25–9) million years ago, and that diversification occurred initially in South America but soon led to colonization of Caribbean islands and Middle America. The six genera present on Caribbean islands each represent separate dispersals, over water, from the mainland during the last 10 million years. Considerable dispersal and speciation also occurred on and among Caribbean islands, probably enhanced by Pleistocene glacial cycles and their concomitant sea level changes. Based on IUCN Redlist criteria, all of the 38 endemic Caribbean island species are threatened with extinction. Twenty-seven species (71%) are Critically Endangered, six species (16%) are Endangered, and five species (13%) are Vulnerable. Sixteen of the Critically Endangered species are extinct, or possibly extinct, because of human activities during the last two centuries. Several of the surviving species are near extinction and in need of immediate protection. Analysis of collection records indicates that the decline or loss of 14 skink species can be attributed to predation by the Small Indian Mongoose. That invasive predator was introduced as a biological control of rats in sugar cane fields in the late nineteenth century (1872–1900), immediately resulting in a mass extinction of skinks and other reptiles. The ground-dwelling and diurnal habits of skinks have made them particularly susceptible to mongoose predation.

Key words: reptile, lizard, evolution, systematics, taxonomy, classification, ecology, conservation, reproduction, biogeography, West Indies, New World, Neotropical, Western Hemisphere, mass extinction

E unum pluribus (from one, many)

Introduction

The lizard genus *Mabuya* Fitzinger (1826) was once considered to be pan-tropical, but in recent years it has been restricted to a clade of species in the Americas (Mausfeld *et al.* 2002; Miralles & Carranza 2010). In reproductive biology, these Neotropical lizards, and some African relatives, are unique among vertebrates in their remarkable convergence with eutherian mammals, having viviparous placentotrophy. This includes long gestation periods (up to 12 months), ovulation of tiny eggs, and placental supply of the nutrients for development (Blackburn *et al.* 1984; Flemming & Blackburn 2003). The number of recognized species in the genus *Mabuya* (sensu lato)—currently 26—has both waxed and waned over the years, depending on the authority. The primary problem has been a scarcity of diagnostic characters. Most of the classical scale characters, such as dorsal and ventral scales, have exhibited overlapping variation among species. Likewise, species have been difficult to characterize in terms of coloration and pattern, because of a conservative theme (brownish lizards with stripes) and a lack of standardized pattern terminology.

Cope (1862b) best summarized the "*Mabuya* problem" and alluded to a possible solution nearly a century and a half ago: "the history of the America Mabuiae is in a state of some confusion, probably on account of the want of close observation in the discrimination of the species." While much progress has been made in recent years using molecular characters (Mausfeld *et al.* 2002; Vrcibradic *et al.* 2006; Whiting *et al.* 2006; Miralles & Carranza 2010), that statement is generally accurate today. Our objective was to correct that problem, at least for species occurring on islands in the Caribbean (Fig. 1). In addition to molecules, we have explored many unconventional morphological characters, and this, as Cope predicted, has permitted much better discrimination of species. The results detail a surprising hidden diversity of species, some of which—unfortunately—are already probably extinct.

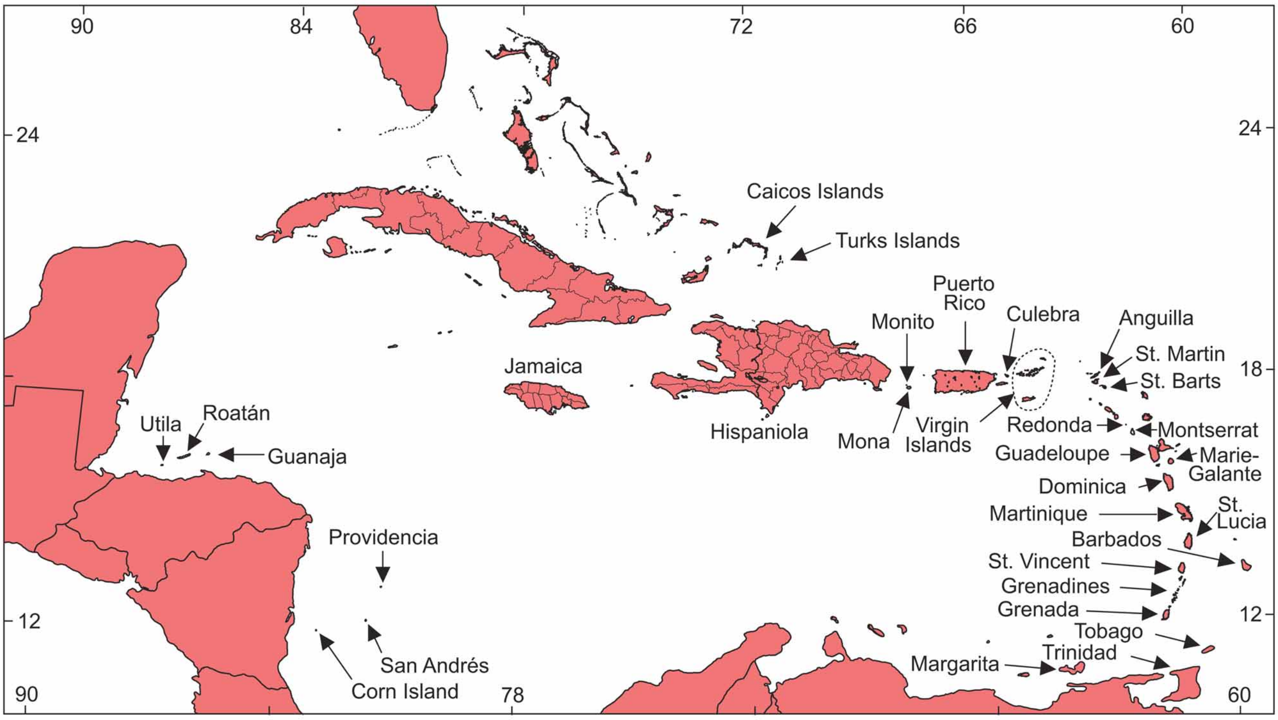


FIGURE 1. Map of Caribbean region. Neotropical skinks occur, or once occurred, on the islands indicated.

The type species of *Mabuya*, *M. mabouya* (Bonnaterre 1789), is from the Caribbean islands. The early loss of the holotype of that species led to some taxonomic instability (Dunn 1936; Avila-Pires 1995; Mayer & Lazell

2000), but this problem was alleviated by restriction of the type-locality to Martinique (Breuil 2002; Miralles 2005). Additional species of *Mabuya* from the Americas were described during the 19th and early 20th centuries, especially from Caribbean islands, and in 1914 seven species were listed as occurring in the West Indies (Barbour 1914). By 1936, 11 species were recognized from Caribbean islands: *M. aenea* (Gray 1831), *M. dominicana* Garman (1887), *M. fulgida* Cope (1862), *M. lanceolata* Cope (1862), *M. lineolata* Noble & Hassler (1933), *M. luciae* Garman (1887), *M. mabouya*, *M. nitida* Garman (1887), *M. pergravis* Barbour (1921), *M. sloanii* (Daudin 1803), and *M. spilonotus* (Wiegmann 1837).

However, in that same year, 1936, the only taxonomic review of *Mabuya* was published by Dunn (1936). In it, he greatly reduced the number of recognized species to nine total throughout the Americas, including three on Caribbean islands: *M. lineolata* and *M. pergravis* on single islands (Hispaniola and Providencia, respectively), and *M. mabouya* elsewhere. He did this by scoring 11 morphological characters often used in skink systematics in 375 museum specimens. The characters included supranasal, prefrontal, and parietal contact, and counts of nuchal scales, supraocular scales, supralabial scale below the eye, midbody scale rows, ventral scales, and anal scales. In the case of supralabial scale below the eye, there was always a single scale directly below the eye and therefore scoring was unambiguous. Overlap of toes and fingers when limbs are pressed against the body, and coloration, were also scored. Many species were subsequently synonymized following the observation that previously recognized species often lacked diagnostic characters, differing only in frequencies of character states. Most ended up in the synonymy of *M. mabouya*, which thus created a species with an enormous distribution, ranging throughout the Neotropics. Taylor (1956), in commenting on Dunn's revision without actually citing it, remarked "for example, a recent reviewer discusses what he regards as a subspecies of this genus, that is said to extend from Middle Mexico, south into South America and the West Indies. This varies in rather extraordinary fashion. For example transverse scale rows on the venter vary between 48 and 72. One suspects that more than a single species is involved." Taylor was not alone in this sentiment, but nearly all subsequent classifications of *Mabuya* have followed, more or less, Dunn's (1936) revision (Peters & Donoso-Barros 1970; Schwartz & Henderson 1988; Avila-Pires 1995; Savage 2002; Henderson & Powell 2009; Miralles & Carranza 2010). Notable dissenters included Taylor (1956), who recognized several species in Middle America (*contra* Dunn), and Underwood (1963), who recognized two of Dunn's synonymized species, *M. aenea* and *M. lanceolata*, in the southern Lesser Antilles.

Despite general adherence to Dunn's (1936) classification, additional species of *Mabuya* have since been described, and *M. mabouya* has been split into several species, resulting in approximately 26 currently recognized species in the genus (Miralles & Carranza 2010). Most of the species from the Caribbean islands and Middle America that were synonymized by Dunn have remained synonymized despite recent molecular phylogenetic and morphological reviews of skinks from the Caribbean region (Miralles 2005; Miralles 2006a; Miralles *et al.* 2009b; Miralles & Carranza 2010). Those species include *M. aenea*, *M. alliacea* Cope (1876), *M. dominicana*, *M. fulgida*, *M. lanceolata*, *M. nitida*, and *M. spilonotus*. Also, the Central American species, *M. brachypoda*, described subsequently by Taylor (1956), has been kept in the synonymy of *M. unimarginata* (Savage 2002; Miralles *et al.* 2009b).

In recent years, several molecular studies involving species of *Mabuya* have appeared (Mausfeld *et al.* 2002; Carranza & Arnold 2003; Miralles 2006b; Vrcibradic *et al.* 2006; Whiting *et al.* 2006; Miralles *et al.* 2009a; Miralles *et al.* 2009b; Miralles & Carranza 2010), and these have helped to further resolve evolutionary relationships and classification. One study involving skinks from different continents led to the current restriction of *Mabuya* to the Americas (Mausfeld *et al.* 2002). One species formerly in *Mabuya*, but now placed in an otherwise Old World genus, *Trachylepis*, also occurs in South America (Bauer 2003; Carranza & Arnold 2003; Miralles *et al.* 2009a; Miralles & Carranza 2010). It is *Trachylepis atlantica* from an island off the east-central coast of Brazil (Fernando de Noronha), with *T. tschudii* as a synonym (Miralles *et al.* 2009a). Most of the molecular studies on *Mabuya* have used mitochondrial genes, usually 12S ribosomal RNA (rRNA) and cytochrome b (cyt b), although one (Whiting *et al.* 2006) collected sequence data on four nuclear genes. Because more sequences are available for the 12S rRNA and cyt b genes, recent studies (Miralles *et al.* 2009b; Miralles & Carranza 2010) have focused on those two mitochondrial genes, assembling larger data sets that included previously published sequences.

The most recent of such molecular studies assembled 12S rRNA and cyt b sequences of 103 individuals of *Mabuya* for analysis of relationships and divergence time estimation (Miralles & Carranza 2010). The new phylogenetic results revealed that, while the species *M. nigropunctata* is monophyletic, it is composed of three distinct clades that should be recognized at the species level. The earliest divergence in the tree (13.2–11.3 million years ago, Ma) was between a clade of two species (*M. carvalhoi* and *M. croizati*) and all others (Miralles & Carranza 2010). In all, these molecular studies of *Mabuya* have increased the knowledge of the evolutionary history of these otherwise enigmatic lizards. But they have also revealed deep genetic divergences within currently recognized species, suggesting the presence of hidden species. Unfortunately, none of these recent studies has been revisionary or has presented results from a comprehensive examination of museum material in major collections. Therefore many lingering questions remain concerning the systematics of Caribbean, Central American, and South American skinks.

We initiated this study after finding unusually large genetic differences among individuals of what was considered to be the same species, *Mabuya mabouya* (or *M. sloanii*), on different islands in the Caribbean. After borrowing museum specimens, we were surprised to find major diagnostic character differences that had been overlooked by Dunn (1936) and subsequent authors. Individuals of the same currently recognized subspecies, from different islands, often differed dramatically in body size and coloration (Fig. 2). It became clear that Dunn (1936) had not only erred in synonymizing taxa described in the nineteenth century, but that he had overlooked, among the specimens that he examined, a number of undescribed species. We then undertook a comprehensive revision of skinks from Caribbean islands that involved molecular phylogenetic analyses and examination of ~750 preserved specimens from 24 museums. We identified 38 endemic species on Caribbean islands, in contrast to the six endemic species currently recognized from those islands. We also erect a new classification of Neotropical skinks that groups the 61 species into one subfamily and 16 genera. Finally, we review and analyze historical collection data and present evidence that implicates a single introduced predator, the Small Indian Mongoose, *Urva auropunctata* (Hodgson), in 14 of the 16 possible extinctions of Caribbean skinks.

FIGURE 2. Preserved museum specimens of adult male and female skinks from two islands on the Puerto Rican Bank, Culebra (left; *Spondylurus culebrae* **sp. nov.**) and Anegada (right; *S. anegadae* **sp. nov.**), currently considered to be the same species, "*Mabuya*" *sloanii*. Note consistent difference in coloration and body size (*S. culebrae* **sp. nov.** = 98 mm SVL, *S. anegadae* **sp. nov.** = 70 mm SVL, maximums). Females from both islands, shown here, contain developing young. All were collected by Chapman Grant in the 1930s and are in the collection of the University of Michigan, Museum of Zoology.

Materials and methods

Molecular analyses

The molecular data set comprised 136 individuals (Appendix 1) and 2,701 total aligned nucleotide sites from the four genes: 12S ribosomal RNA (rRNA), 16S rRNA, cytochrome b (cyt b), and myosin heavy chain. The first three are mitochondrial genes and the last is a nuclear protein-coding gene. We contributed 76 new sequences from 22 samples, but most of the sequence data came from the public sequence databases (Genbank 2011), having been published and analyzed in a succession of earlier studies (Carranza & Arnold 2003; Vrcibradic *et al.* 2006; Whiting *et al.* 2006; Miralles *et al.* 2009b; Miralles & Carranza 2010). Methods used for the collection of the new DNA sequences are detailed elsewhere (Heinicke *et al. 20*07; Hedges *et al. 20*08). Localities, Genbank accession numbers, and museum numbers (if applicable) for all sequences used are in Appendix 1. Alignments (considering amino acid translations) were performed with MUSCLE in MEGA 5.0 (Tamura *et al.* 2011). Alignment of the two rRNA genes was done with reference to secondary structure models, as described elsewhere (Heinicke *et al.* 2009).

First, we conducted a phylogenetic analysis of all available sequence data (new and previously collected) using the four genes. A maximum likelihood (ML) analysis was performed using MEGA 5 (Tamura *et al.* 2011), unpartitioned, using the best-fitting evolutionary model under the Bayesian Information Criterion, the GTR + I + Γ option (general time reversible + invariant sites + gamma distribution of changes). 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 bootstrap analysis (1,000 replicates). A Bayesian phylogenetic analysis using MrBayes 3.1 (Ronquist & Huelsenbeck 2003) also was performed, using the GTR + I + Γ model. The Bayesian analysis was set to two parallel runs for five million generations, sampled every 500 generations, and each run employed three heated and one cold chain, with a temperature parameter of 0.25. The first 25% of samples were discarded as burn-in. Convergence was assessed by the standard deviation of split frequencies (< 0.01 in all cases).

A second analysis performed was a linearized tree of cyt b sequence divergence using the same topology as in the four-gene analysis. This was done to facilitate comparison of sequence divergence levels among these species with those in other groups of organisms. Sequence divergence in cyt b has been used in systematic studies of organisms for decades, and it is among the most widely used and compared gene in vertebrates (Johns & Avise 1998). The linearized tree was computed in MEGA 5.0 (Tamura *et al.* 2011).

The third analysis was Bayesian divergence time estimation and estimation of a molecular timetree. Previously, divergence times of these Neotropical skinks have been estimated using common rates borrowed from other studies (Carranza *et al.* 2004; Arnold *et al.* 2007; Arnold *et al.* 2008; Carranza 2008), a method that can be justified when internal calibrations are not available. Miralles and Carranza (2010) performed a type of linearized tree using such rates. Because we added considerably more new sequences from the Caribbean region, where some calibrations are available, we instead performed an internally-calibrated Bayesian time analysis.

Popular applications of Bayesian time estimation use either a random (independent) rate model or an autocorrelated rate model, but the two models are rarely used in the same study. However, simulations show that results differ depending on the model, and it is not possible to accurately determine the appropriate model to use because of the low power of tests (Battistuzzi *et al.* 2010). Therefore, it has been recommended that both models be used and the results combined, for a more accurate estimation of time. We did this for our data set using MCMCTREE (Yang 2007), which is a method that can perform both models.

We used four calibration points. The first was the isolation of some allopatric species in the Virgin Islands, set at 2.6 Ma (Pliocene-Pleistocene boundary). This node is represented by the divergence of *Spondylurus macleani* from its closest relatives in the analysis, *S. culebrae* **sp. nov.**, *S. monitae* **sp. nov.**, and *S. sloanii* (*S. monitae* **sp. nov.** is on Monito and would have had to disperse across deep water). Because much of the bank was exposed only 12,000 years ago, at the end of the last glacial maximum, these islands and their endemics are likely quite young. Mayer and Lazell (2000) estimated that Carrot Rock (*S. macleani*) became isolated from its nearest island no more than 3,000 years ago and suggested that the species has arisen only since that time. We calibrated this node conservatively, at the onset of the glacial cycles, to allow for the possibility that these species became isolated during an earlier sea level high (interglacial) of the Pleistocene rather than the most recent sea level high. Applying this soft-bound calibration (maximum) results in a uniform probability distribution 2.6–0 Ma, with a 2.5% exponential decay > 2.6 Ma.

A second calibration was an upper bound (37.2 Ma) for any divergence in the Greater or Lesser Antilles, before which there is no geologic evidence that islands were permanently subaerial (Iturralde-Vinent & MacPhee 1999). This calibration was applied to the divergence of the Jamaican species (*Spondylurus fulgidus*) and other members of the large clade (*Spondylurus*) to which it belongs. That splitting event is assumed to have occurred on the Caribbean islands because all descendants are distributed on the islands. Applying this soft-bound calibration results in a uniform probability distribution 37.2–0 Ma, with a 2.5% exponential decay > 37.2 Ma.

The third and fourth calibrations were soft uniform bounds applied to the divergence of the African species and American species, set at 68–7.0 Ma. The minimum time of 7.0 Ma was taken from an earlier molecular clock estimate for that node, 7–9 Ma (Carranza & Arnold 2003). We agree with Miralles and Carranza (2010) that the time estimate from the earlier study, for methodological reasons, was an underestimate of the actual divergence. Therefore we use the time of 7.0 Ma as a conservative minimum estimate of that divergence. The maximum time of 68 Ma was taken from a recent molecular clock analysis of scincid lizards (Skinner *et al.* 2011). It is an estimate of the divergence time of the cosmopolitan "*Mabuya* Group" (= American, African and Asian species) from other skink groups (Mabuyidae from other families; see below). Because that divergence predated the split of the American lineage from the African lineage, and the split of that combined American + African lineage from the Asian lineage, we use the time of 68 Ma here as a conservative maximum calibration for the origin of the American lineage. Applying this soft-bound calibration results in a uniform probability distribution 68–7.0 Ma, with a 2.5% exponential decay > 68 Ma and < 7.0 Ma. Times obtained for each model (random and autocorrelated) were averaged and the Bayesian credibility intervals were composited by taking the lowest and highest limits of the two analyses, following methods discussed elsewhere (Battistuzzi *et al.* 2010).

In a recent commentary, Heads (2011) discussed the use of island age as a maximum calibration point for endemic clades. We agree with his concerns regarding the Hawaiian islands and other hotspots where an endemic clade may have evolved on islands now submerged; but this situation does not apply to the Caribbean islands. However, he provided no theoretical explanation as to why island calibration is problematic in other situations. Instead he pointed to a few empirical studies that resulted in molecular time estimates for endemic clades that predated the presumed geologic emergence of the islands (e.g., Thorpe *et al.* 2005). Given that molecular and geologic times, and phylogenetic trees, are all subject to error, some contradictory results are not surprising. It remains the most parsimonious assumption that the common ancestor of a monophyletic, endemic, terrestrial island clade lived on that island and not elsewhere.

Morphological analyses

We made every attempt to locate and borrow all museum specimens of Caribbean island skinks, with the exception of a few long series of some well-represented species (e.g., from Dominica). We also examined representatives of mainland species for comparison with Caribbean species and for diagnosing genera (Appendix 2). In all, we examined ~750 preserved specimens from 24 museums. Of the 61 species of *Mabuya* (*sensu lato*) recognized here, we have examined specimens (or, in a few cases, photographs) of 55 species (all except *Aspronema cochabambae*, *Exila nigropalmata*, *Maracaiba zuliae*, *Orosaura nebulosylvestris*, *Psychosaura agmosticha*, and *Varzea altamazonica*).

In making comparisons of Caribbean with mainland species, we encountered some difficulty in relating our work to that in recent systematic reviews of mabuyine skinks from South America (Miralles *et al.* 2005a; Miralles *et al.* 2009a; Miralles *et al.* 2009b; Miralles & Carranza 2010), especially Venezuela, because many specimens from major museums (i.e., those generally accessible) were not examined in those studies and thus those specimens were unplaced taxonomically. Although this did not affect our generic diagnoses, and we could identify most species based on diagnostic characters, we encountered specimens that were not readily diagnosed to species reviewed in these previous studies. A thorough review of material from Venezuela and other countries in South and Middle America is much needed.

Museum abbreviations are as follows: AMNH (American Museum of Natural History, New York City, New York, USA), ANSP (Academy of Natural Sciences, Philadelphia, Pennsylvania, USA), BMNH (Natural History Museum, London, England, UK), BWMC (Bobby Witcher Memorial Collection, Avila University, Avila, Missouri, USA), CAS (California Academy of Sciences, San Francisco, California, USA), CM (Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA), FMNH (Field Museum of Natural History, Chicago, Illinois, USA), KU

(University of Kansas, Museum of Natural History, Lawrence, Kansas, USA), LSUMZ (Louisiana State University Museum of Zoology, Baton Rouge, Louisiana, USA), MCZ (Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA), MHNLS (Museo de Historia Natural La Salle, Caracas, Venezuela), MNHN (Muséum National d'Histoire Naturelle, Paris, France), MPM (Milwaukee Public Museum, Milwaukee, Wisconsin, USA), PSM (Slater Museum of Natural History, University of Puget Sound, Tacoma, Washington, USA), RT (Collection of Richard Thomas, University of Puerto Rico, San Juan, Puerto Rico, USA; vouchers deposited in UPRRP), SBH (Frozen tissue and voucher collection, S. Blair Hedges, Pennsylvania State University, University Park, Pennsylvania, USA; vouchers deposited in USNM), SMNS (Staatliches Museum für Naturkunde Stuttgart, Stuttgart, Germany), TCWC (Texas Cooperative Wildlife Collection, Texas A&M University, College Station, Texas, USA), UF (Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA), UIMNH (University of Illinois Museum of Natural History, Champaign, Illinois, USA), UMMZ (University of Michigan Museum of Zoology, Ann Arbor, Michigan, USA), UPRRP (Museum of Biology, University of Puerto Rico, San Juan, Puerto Rico, USA), USNM (National Museum of Natural History, Washington, D.C., USA), YPM (Yale Peabody Museum, New Haven, Connecticut, USA), ZFMK (Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn, Germany), ZMB (Museum für Naturkunde, Berlin, Germany), ZMH (Zoologisches Museum Hamburg, Germany), and ZMUC (Zoological Museum, University of Copenhagen, Denmark).

We scored a primary suite of 30 morphological characters used in the diagnoses including six of body proportions, 18 of scalation, and six of pattern and coloration. Those characters included some used in past studies of Neotropical skinks (e.g., head length, number of supraocular scales, supranasal contact, etc.) as well as characters not used previously or commonly. Although some new taxa could be diagnosed by conventional characters alone, the unconventional characters proved to be the most useful in diagnoses, especially for closely related species. These included frontonasal width versus length, suture lengths between supraocular scales and supraciliaries, supranasal length versus width, snout width versus head length, supraciliary-2 versus supraciliary-3 length, limb (arm + leg) length, eyelid window length, supraciliary-1 length, middorsal stripe width versus dorsolateral stripe width, interparietal width, toe length, ear height, internarial distance, nostril width versus nostril length, total head scales length (posterior of rostral to posterior of parietals), and rostral height versus rostral length (Fig. 3).

We identified non-overlapping, diagnostic, morphological characters that distinguish all species. Initially we used discriminant function analysis (DFA) to separate some species, which indicated that there was quantitative (frequency) information of value in distinguishing taxa. However, non-overlapping characters are more efficient in diagnosing species, and therefore we abandoned DFA when we found that species could be separated without it.

The sex of specimens has been rarely recorded and used in taxonomic work on Neotropical skinks, including recent studies (Miralles 2006a, 2006b, Miralles *et al.* 2005a, 2005b, 2009a, 2009b, Miralles and Carranza 2010). This has made comparison with those studies and species, regarding any sex-related differences such as body size, virtually impossible. Fortunately, sexual size dimorphism is modest in Neotropical skinks, with females being slightly larger than males. This was true in the four species with the largest sample sizes, where females were 8% larger than males (n = 198 adults), on average: *Mabuya dominicana* (females 9.0% larger), *Spondylurus anegadae* **sp. nov.** (females 6.3% larger), *S. caicosae* **sp. nov.** (females 9.4% larger), and *S. culebrae* **sp. nov.** (females 9.2% larger). In some South American species, males have been found to have relatively larger heads (Rocha & Vrcibradic 1999), but we did not observe any striking sexual differences in head size or coloration in Caribbean island species.

Sex determination required dissection and gonadal examination, which we attempted with all specimens for which we were given permission to dissect; the majority of specimens already had been dissected in previous years. Some specimens were old and not well-preserved, making gonadal sex determination difficult, except in obvious cases where developing fetuses were present. In total, we were able to sex 65% of the specimens (239 females, 192 males, and 69 juveniles), which was insufficient to be able to make sex-based comparisons in all species and characters. For these reasons, we were not able to partition character data by sex. To determine if this decision might lead to false diagnoses, we tested for significant sex-related differences in characters of those four species with the largest sample sizes. The most important diagnostic characters, those involving discrete differences (e.g., scale counts), did not show significant differences (t-test, $p < 0.01$) between sexes. This was true for most measured characters as well, including ratios of stripe lengths and widths, and of scale lengths and widths. As expected, body size (snout-vent length), and proportional characters derived from body size, showed significant differences between sexes, although absolute values were modest (~10%). We have chosen to include these body size-related characters in the diagnoses, especially when they show complete separation of all individuals (males and females) of one species from all individuals of another species. For those cases, sex dimorphism would have no bearing on recognition of a taxon. No taxa are diagnosed solely on a character difference that might be explainable by sexual dimorphism.

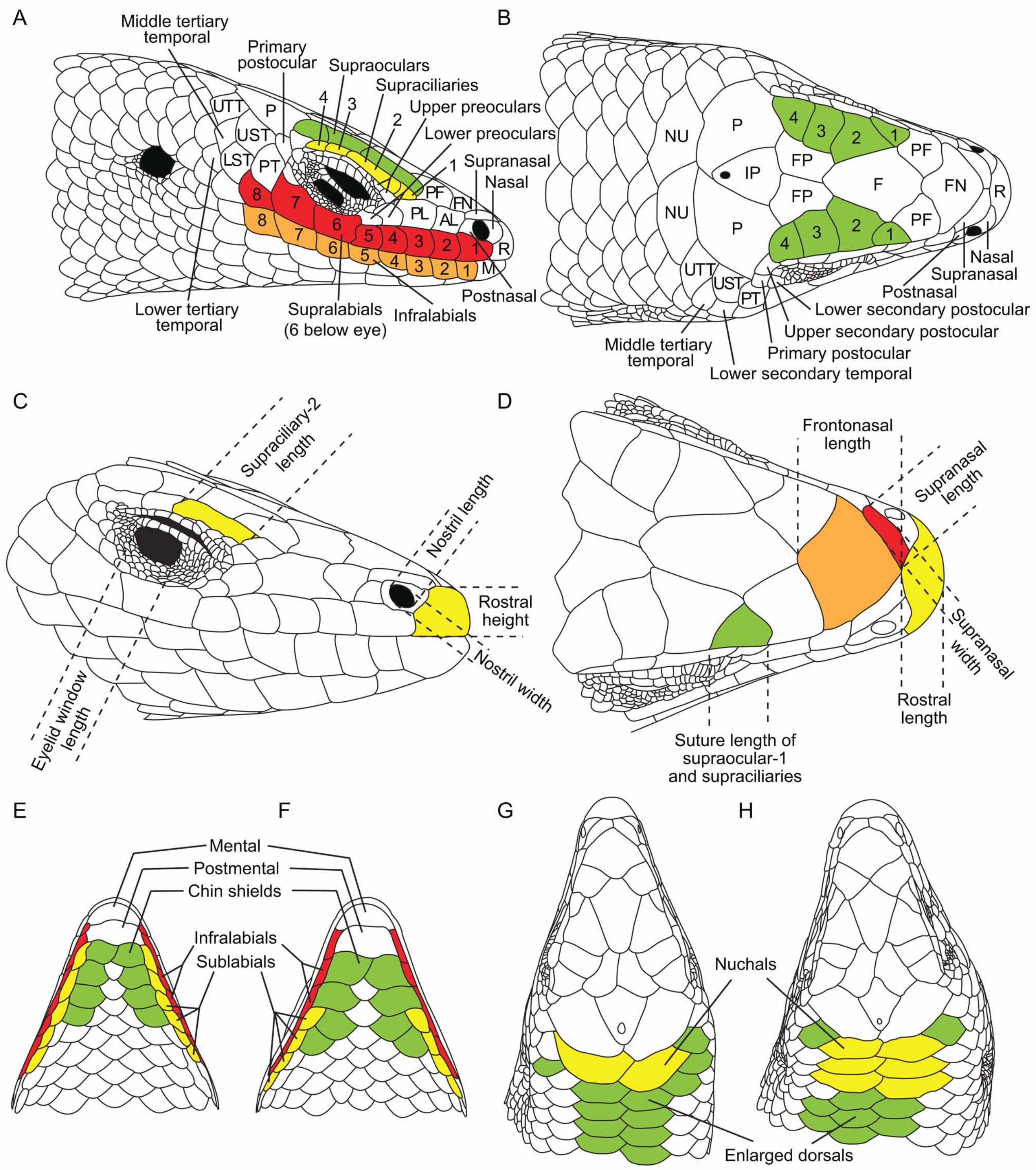


FIGURE 3. Head scalation in Neotropical skinks (Mabuyidae, Mabuyinae). Locations and names of head scales on side (A) and top (B) of head. Abbreviations are AL (anterior loreal), F (frontal), FN (frontonasal), FP (frontoparietal), IP (interparietal), LST (lower secondary temporal), M (mental), NU (nuchal), P (parietal), PF (prefrontal), PL (posterior loreal), PT (primary temporal), R (rostral), UST (upper secondary temporal), and UTT (upper tertiary temporal). Selected (non-standard) measurements on side (C) and top (D) of head. Length of eyelid window, supraciliary-2, narial opening, and supranasal scale defined by longest axis. Other scale length measurements (not shown) follow axis of body. Chin scale configuration: (E) no contact between chin shields and infralabials; (F) two chin shields (each side) in contact with infralabials. In the former case, the sublabials contact the postmental whereas in the latter case they are separated by two chin shields. Nuchal scales: (G) one transverse row; (H) three transverse rows; note presence of enlarged dorsals (not scored as nuchals) in both cases.

These skinks are live-bearing, and any fetuses observed during examination of the specimens were counted and (in some cases) measured and photographed. All measurements were taken with digital calipers (Mitutoyo; 0.01 mm accuracy). Specimen examinations were made with Wild M3Z stereo-zoom microscopes.

Body proportions. We measured the following standard characters: snout-vent length (SVL; tip of snout to vent opening), head length (HL; tip of snout to anterior edge of auricular opening), head width (HW; at widest point), snout width (SW; measured between narial openings), ear length (EL; distance between anterior and posterior edges of auricular opening), and fourth toe length (length of toe-IV, from junction with Toe-III to the most distal edge of claw). Character measurements were divided by SVL to produce relative sizes that would allow comparison among adult individuals of different body size. For the majority of specimens, relative sizes show little noticeable bias, but most characters are negatively allometric and hence the largest individuals will have proportionately smaller structures (heads, scales, etc.) and juveniles will have proportionately larger structures. Therefore caution must be used in comparing across wide size ranges. To examine variation in ecological traits, we also estimated body mass from SVL using an allometric slope of 3.029 and intercept of –4.821, which were values obtained by analysis of a diversity of scincid lizards (Meiri 2010). These were similar to values obtained for three species of South American skinks (Vrcibradic *et al.* 2007), for a small sample of skinks from Dominica (Bullock & Evans 1990), and for lizards of similar body shape (S.B.H., personal observations).

Many tails were broken or regenerated, limiting the value of tail length. Nonetheless, this measurement was reported for holotypes, if available, and was measured from the vent to the tip of the tail. Ear height (distance between upper and lower edges of auricular opening) was used as a diagnostic character in one case, and internarial distance (between narial openings) in another.

A body proportion character used by Dunn (1936) and others, as a proxy of limb length, was the overlap (or not) of "adpressed limbs" (i.e., when forelimbs are oriented posteriorly along the body and hindlimbs are oriented anteriorly along the body). The problem with this character is that formalin-fixed specimens—which include most in U.S. collections—are usually too stiff to contort in this way without damaging the specimen, as has been noted elsewhere (Harvey *et al.* 2008). Even some old ethanol-preserved specimens could be damaged. In some cases we measured limb length (from junction with body plane to claw tip of longest digit), using string, when it appeared to be of diagnostic importance.

Scalation. Our standard suite of scale characters included 14 counts and five scale contacts (presence/absence; Fig. 3). In cases where scales are numbered, the numbering extends from anterior to posterior. Some information common to all species was not recorded. For example, in all, the lower eyelid was undivided, with a transparent disk, and there was a single row of small scales across the dorsal edge of the eyelid window. Also, fingers and toes were clawed.

Midbody scale rows were counted around the body midway between the forelimbs and hindlimbs. Dorsal scales were counted in a longitudinal series from behind the parietal scales (including nuchals) to a point above the vent, a common method in lizard systematics (e.g., Cochran 1941), including skink taxonomy (Taylor 1956; Sadlier & Bauer 1997). Other authors have counted these scales similarly but have stopped at the posterior edge of the hindlimbs (not the vent), thus resulting in, usually, 1–3 fewer scales (e.g., Smith 1946; Avila-Pires 1995; Zug 2004; Miralles 2006a), although the difference could be greater. Yet other authors have counted dorsals from behind the parietals to the anterior edge of the hindlimbs (e.g., Mayer & Lazell 2000) or in a series equal to the distance between the tip of the snout and posterior border of parietals (e.g., Barbour 1921), both of which will result in lower counts than those made here. We did not attempt to use a correction factor for conversion of published dorsal count data because it would result in estimates with greater variability.

Ventral scales were counted in a line from (and including) the chin scale (mental) to the vent, which is also a widely used method in previous studies on these lizards (e.g., Garman 1887; Barbour & Ramsden 1919; Dunn 1936; Cochran 1941; Mayer & Lazell 2000; Ineich *et al.* 2004). Others have used a similar method, postmental-to-vent, resulting in counts of only one scale fewer (Mausfeld & Vrcibradic 2002). Yet others have counted ventrals from the anterior margin of the forelimbs to the vent (e.g., Rebouças-Spieker 1981; Avila-Pires 1995; Miralles 2006a), which results in a smaller number of scales, precluding comparison with our counts. Ventral counts starting at the forelimbs are necessary for many lizard groups, and hence in broad reviews of lizards (Avila-Pires 1995), because chin scales are often modified and difficult to count. This is not true in Neotropical skinks, where the additional ventral scales below the head can be counted and add to the diagnostic ability of this character. We also combined counts of dorsals and ventrals in each specimen as another character.

In all species, the gulars were round, smooth, and imbricate, and hence similar to ventrals. Taylor (1956) found that the arrangement of chin scales was useful in distinguishing taxa in Middle America, but it seems to have been overlooked as a useful character in Neotropical skinks since that time. We found it to be helpful in diagnosing Middle American taxa and some others. The character scored was the number of chin shields on each side (hence "pairs" of chin shields) contacting the infralabials, between postmental and first sublabial (Fig. 3); in this character, point contact was ignored, with only broad contact between the chin shields and the infralabials being scored. Contact or not between the chin shields themselves was not considered. The separation of the paired chin shields from the infralabials is caused by the presence of sublabials, a row of small, elongate scales medial to the infralabials. In species where usually no chin shields contact the infralabials, sublabials extend all the way anterior to the fused postmental. In other species, the sublabials extend anteriorly, but only partially, allowing some contact to occur between paired chin shields and infralabials. Variation in the extension of this row of sublabials appears to be related to the narrowness of the head, with narrow-headed species (or those with a more acuminate snout) having fewer chin scales and hence a shorter, less extended, row of sublabials.

Digital lamellae, the plate-like scales below each digit, were counted from the base (junction with adjacent digit) to the tip (claw), on the longest (fourth) finger (finger-IV) and longest (fourth) toe (toe-IV). In some cases, granular (non-plate-like) scales were present near the base of the digit and therefore the first scale to be counted was the first plate-like scale, usually rectangular and wider than long. We also combined counts of the two digits in each specimen as another character (finger-IV + toe-IV lamellae). We counted total lamellae on all 10 digits for even greater discrimination, but this was done for only 136 specimens in 45 (out of 55) species. We report these total lamellae counts for genera (Table 2) and for species from Caribbean islands (Table 4). However, the sparse sampling limits the inferences that can be drawn, for diagnoses, except when differences are large.

Counts of prefrontal and frontoparietal scales were taken (usually two scales each) and showed diagnostic value at the generic level. Some authors refer to the condition of a single scale as "fused." Usually there are 1–3 enlarged upper and two lower preoculars (Fig. 3), along with smaller accessory scales, but they showed little diagnostic variability. On the other hand, counts of supraoculars, supraciliaries, and the supralabial scale below the eye were all useful in distinguishing species.

The scales behind the eye and on the side of the head pose a slight problem for homology and terminology. The problem is that the slightly enlarged scales immediately behind the eye can vary in size and configuration among species, leading to confusion. We recognize a single primary temporal, two secondary temporals, and three tertiary temporals (Fig. 3). The postoculars—pretemporals of Greer and Nussbaum (2000)—are scales between the eye and the temporals, and they typically show a gradation in size ranging from numerous granular scales bordering the eye to larger ones resembling temporals, bordering the temporals. The largest is the primary postocular, and it is bordered by the upper secondary and lower secondary postocular (Fig. 3). Usually, in mabuyine skinks, those three postoculars are joined by two smaller postoculars to form a set of five postocular scales that are slightly larger than the other postoculars. The nomenclature of the temporal scales varies among authors (Smith 1946; Greer & Nussbaum 2000). We agree with Greer and Nussbaum (2000), that an enlarged pretemporal (our "primary postocular") scale can be easily confused with a temporal scale. We considered only the scales that are always enlarged to be temporals to avoid problems with homology (Fig. 3). There is nothing incorrect about any naming system as long as it is internally consistent. In the end, the number of postocular and temporal scales or their configuration had little diagnostic value in this group of skinks. The supralabials and infralabials often grade into the neck scales gradually rather than abruptly, making it difficult to determine an end point.

Conventionally, nuchal scales have been defined as distinctly enlarged scales on the nape of lizards, starting immediately behind the parietals (Smith 1946). Rather than counting each enlarged scale, they are counted as transverse rows (each row being perpendicular to body axis) of nuchals. We found this classical definition to work well (Fig. 3G–H), with very few cases that were problematic in scoring. We did not use a recently proposed nuchal definition (Miralles 2006a), which recognized two types of nuchals. According to that definition, a primary nuchal scale "is in contact with the posterior border of the parietals. Each scale of this always singular pair occupies the equivalent of three transverse rows of dorsal cycloid scales (sometimes two)." Secondary nuchals were defined as those "along the vertebral axis, posterior to the" primary nuchals and occupying the "equivalent of two transverse rows of dorsal cycloid scales." Based on the accompanying figure (Miralles 2006a) the rows being discussed were longitudinal, not transverse. In either case, we were unable to use that definition because the first row of enlarged scales is sometimes not a pair but a single widened scale or more than two widened scales. For these reasons we prefer to call them "rows" (tranverse) of nuchals rather than pairs. We also did not see clear evidence of two states. Rather, the nuchal scales of each successive row were typically similar in size (Fig. 3H); see also Stejneger (1904:608) and Mayer and Lazell (2000:875) for similar diagrams. If, instead, we were to use a two-state definition of nuchals (Miralles 2006a), some specimens (e.g., Fig. 3H), would be scored as having even more than five nuchals, and distinguishing a slightly enlarged dorsal scale from a secondary nuchal would be difficult in many cases. Also, homology of such scales is less clear under the two-state definition.

Some scale measurements were found to have diagnostic value in some comparisons. These included interparietal and frontonasal widths, rostral width, frontonasal length, anterior loreal length, supraciliary-1 length, and supralabial-7 length. These followed the standard definition of length and width (along, or transverse to, the body axis, respectively); widths were measured at widest straight-line distance and length at longest straight-line distance, without accounting for any curvature in the scale. In one case, rostral height was used, measured from the base to the top of the rostral (Fig. 3). Also, the lengths of sutures between scales (without respect to body axis) were used in some cases: parietal and upper secondary temporal, anterior and posterior loreals (interloreal suture), and frontal and frontonasal (also called prefrontal separation). In these cases, lengths are straight-line distances from one end of the suture to the other.

Contact between particular scales has been used frequently as a character in the systematics of Neotropical skinks. We scored scales as in contact regardless of whether that contact was across a narrow zone (point contact) or wide zone (contact scored as Y = yes, N = no). The following pairs of scales were scored for contact, in the diagnoses: supranasals, prefrontals, supraocular-1/frontal (associated with number of supraoculars), and parietals. Also, contact between two other scale pair was used in some comparisons: prefrontal and supraciliary-1, anterior loreal and supraciliary-1.

Pattern and coloration. Nearly all species of Neotropical skinks are striped, usually with at least a pair of dark lateral stripes. This gives the initial impression that pattern diversity is limited. However, on close inspection there is considerable variation in pattern and coloration (Fig. 4), and each species can be characterized by a species-specific pattern. Differences among species may involve the presence or absence of pattern elements, their size, and their contrast. About half of the species on Caribbean islands have, in addition to the typical dark lateral stripes, a pale middorsal stripe and a pair of dark dorsolateral stripes. The terms "pale" and "dark" are used here in a relative sense, in that a pale middorsal stripe is paler than adjacent "dark" stripes but they may not be white. Likewise, dark spots or stripes are darker than the surrounding base color but may not be black or even dark brown. Besides being diagnostic for a clade of species, the relative widths of the various stripes also proved to be diagnostic of some individual species. Therefore we scored the presence or absence of a pale middorsal stripe, dark dorsolateral stripes, pale dorsolateral stripes, dark lateral stripes, pale lateral stripes, dark ventrolateral stripes, pale ventrolateral stripes, and dark ventral stripes (Fig. 4).

We also measured the width of the pale middorsal stripe and dark dorsolateral stripe (at a point between auricular openings). Those measurements were divided by SVL to produce relative sizes that would allow comparison among individuals of different body size. We found that the ratio of dark dorsolateral stripe width/pale middorsal stripe width had diagnostic value. In some species and individuals, the pale middorsal stripe color was the same as the dorsal body (ground) color. Seen in isolation, those individuals might be scored as lacking a pale middorsal stripe. However, we chose to score all Caribbean skink species with dorsolateral stripes (*Spondylurus*) as having a pale middorsal stripe because there were intermediate conditions, and the color difference did not affect the systematic value of the character (the stripe width; not measured in *S. lineolatus* because of uncertain homology). Some South American species also have a dark middorsal stripe, not illustrated in Fig. 4.

The coloration of nearly every species from Caribbean islands can be described as some shade of brown. Two factors, age and preservation, affect pattern and coloration. Pattern was sometimes missing from the oldest specimens and was considerably faded in specimens from U.S. museums that were fixed initially in formalin and were several decades old (or older). Those fixed in ethanol retained pattern the best, in some cases for two centuries or more. Often preserved specimens of these skinks have a bluish-green appearance in species known to lack those colors in life, indicating a preservation bias. However, two Caribbean island species (*Spondylurus lineolatus* and one named herein from islands of the Anguilla Bank) have blue tails in life. Reports of greenish or bluish colors in any other species will need to be documented with photographs to avoid confusion with literature accounts and preservational artifacts; we have assumed that body colors in life are (or were, in the case of extinct species) shades of tans and browns, not greens and blues (although the actual coloration in preservative is described here in each account). Other colors in life, of some species, are copper and bronze, and sometimes the lateral stripe, or anterior region of body, is orangeish or reddish. The ventral striping of species from Barbados and St. Lucia (and seen, weakly, in a few specimens from other islands) is real pigmentation, but the dorsal or ventral striping in some old and faded specimens appears to be another artifact of preservation, where clearing out of the scales leaves whitish central areas of scales and darker edges that form a continuous vertical line.

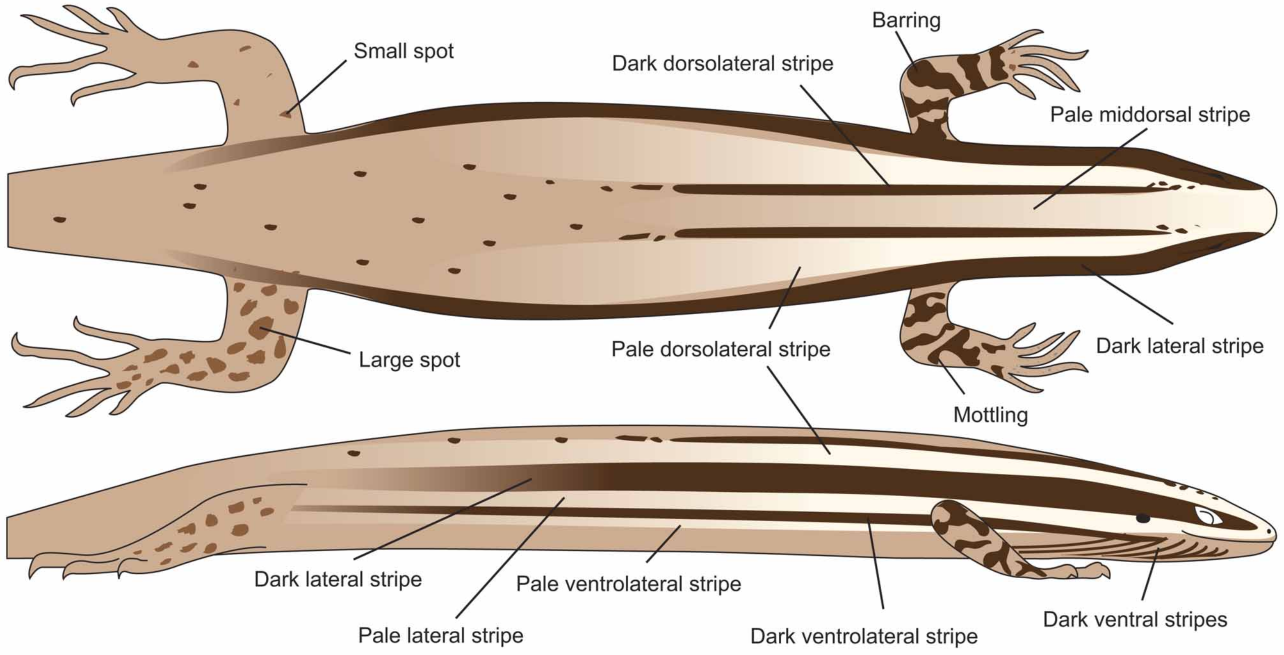


FIGURE 4. Characterization of pattern elements in skinks of the Subfamily Mabuyinae (top, dorsal view; bottom, side view). For species with dark dorsolateral stripes, the pale middorsal stripe is defined as the zone between the dark dorsolateral stripes.

Limb pattern (Fig. 4), if present, often consisted of spotting or mottling (unorganized blotches); in some cases the blotches were organized into parallel bands (bars). Some individuals have palms and soles that are distinctly darker than the rest of the limbs, and this has been a commonly used character in past literature. We scored this character as well but found it to be problematic in many older specimens where coloration had either faded or darkened in preservative. Especially, old formalin-fixed specimens tend to become evenly tanned or browned, obscuring much of the original coloration and pattern. That original coloration in life, of the palms and soles, is known only for a small number of species, and that is not likely to change in the Caribbean region because so many species have disappeared. Despite this, we have retained palm and sole color as a character because it is useful in some comparisons. We also include images of palms and soles for some species. We scored palms and soles as pale if completely unpigmented or if grayish (fine flecks of dark brown pigment). We scored them as dark if they were distinctly brown, or appeared (residual pigment) to have once been brown. Most species were consistent in palm and sole coloration and therefore outliers were ignored (assumed to be affected by preservative) and a single state assigned to each species. The one exception was *Marisora brachypoda* (a species complex), where scores were mixed and the percentages retained.

Variation in pattern and coloration exists within each species, but it is usually less than variation among species. Therefore, it is possible to characterize the typical (representative) pattern for each species, while recognizing that each specimen may differ from this pattern in some aspects. We did this by creating a single (consensus) illustration, for each of the 38 species covered in this monograph, that we considered to represent the species pattern, based on the specimens that we examined. In some cases, the holotypes or lectotypes did not have the consensus pattern because it had faded over many years in preservative.

Systematic accounts

Species of Caribbean island skinks have long and complex taxonomic histories, sometimes extending two centuries. For this reason we present the synonymies in a chronological rather than taxonomic format, to assist in navigating this history. For genera, we identified 12 key (diagnostic) characters including (1) number of frontoparietals, (2) number of supraciliaries, (3) number of supraoculars, (4) prefrontal contact, (5) parietal contact, (6) number of nuchal rows, (7) number of dorsals + ventrals, (8) total lamellae, (9) presence of dark middorsal stripe, (10) presence of dark dorsolateral stripes, (11) presence of dark lateral stripe, and (12) presence of dark ventral striping. For species diagnoses we identified 29 key characters including (1) maximum SVL in males, (2) maximum SVL in females, (3) snout width, (4) head length, (5) head width, (6) ear length, (7) toe-IV length, (8) number of prefrontals, (9) number of supraoculars, (10) number of supraciliaries, (11) number of frontoparietals, (12) number of the supralabial scale below eye, (13) number of transverse nuchal rows, (14) number of dorsals, (15) number of ventrals, (16) number of dorsals + ventrals, (17) number of midbody scale rows, (18) number of finger-IV lamellae, (19) number of toe-IV lamellae, (20) number of finger-IV + toe-IV lamellae, (21) supranasal contact, (22) prefrontal contact, (23) supraocular-1/frontal contact, (24) parietal contact, (25) presence of pale middorsal stripe, (26) presence of dark dorsolateral stripe, (27) presence of dark lateral stripe, (28) presence of pale lateral stripe, and (29) color of palms and soles (dark/pale).

Following the numbered diagnoses we describe characters that distinguish the new taxon from other taxa. All genera are diagnosed, and all species are assigned to genera, but only the 38 species endemic to Caribbean islands are formally described or redescribed. *Marisora brachypoda* occurs on both the mainland and some islands off of Central America, so it is not described here. In some cases, specimen damage precluded scoring of a character, and therefore the total number scored for that character was fewer than the total number of specimens listed as examined. In the few cases where we were unable to examine holotypes, descriptions were made based on the material examined. Holotypes and lectotypes, and in some cases, other individuals, are illustrated where possible. Unless otherwise identified, all photographs were taken by one of us (S.B.H.) for three purposes: illustration, documentation of scalation for later data collection (if needed), and as a basis for head scale drawings. In the latter case, a black watercolor ink was sometimes applied to the head to enhance scale boundaries, and rinsed off completely after photography, without leaving a trace on the specimen. Head scale illustrations were then drawn by a graphics artist in vector format, with illustration software, directly on a digital image of the head, thus avoiding the distortions of scale and perspective that sometimes accompany camera lucida drawings. Because organisms are three-dimensional objects, the two-dimensional scale bars that accompany some of the photographs and illustrations should not be used for precise measurements, but rather for general guidance in overall dimension. Because of the large number of new combinations (comb. nov.), they are so identified only for Caribbean taxa and not in all instances.

Results

Molecular analyses

All but two of the 16 genera of mabuyine skinks diagnosed in this study were represented in the molecular phylogeny of 37 mabuyine skinks species (Fig. 5). Those other two genera, *Capitellum* and *Alinea*, are possibly extinct. A third (*Exila*) was represented by a single sequence. Of the 13 generic clades with multiple sequences, 11 had significant Bayesian support values and seven had significant ML and Bayesian support values. Of the two remaining clades, one (*Notomabuya*) had near significant (93%) Bayesian support. Only *Varzea* was weakly supported with both methods, yet non-molecular evidence has suggested a close relationship of the two included species (Miralles & Carranza 2011). Most of the 14 clades, recognized here as genera, have appeared in previous molecular analyses, and we discuss the diagnostic traits that distinguish each of them in the taxonomic accounts below.

The higher-level relationships of groups remain difficult to resolve in this four-gene analysis, as was found by Miralles and Carranza (2010) in their two-gene analysis (12S rRNA and cyt b). There are several groupings in agreement among the various studies. First, *Panopa* (*P. carvalhoi* and *P. croizati*) appears to be the basal living lineage in the most recent analyses. Second, a cluster of genera (*Mabuya*, *Maracaiba*, *Marisora*, and *Orosaura*) from northern South America, Central America, and Caribbean islands is strongly supported (91% ML bootstrap) in our analysis, and it appears in earlier analyses (Miralles *et al*. 2009b; Miralles & Carranza 2010). We refer to this as the "Northern Clade" rather than the Caribbean Clade (Miralles *et al*. 2009b) for reasons discussed later. The closest relative of the Northern Clade is *Aspronema* and the closest relative of the Northern Clade + *Aspronema* is *Varzea*. Those deeper nodes are not strongly supported but appear in earlier two-gene analyses (Miralles *et al*. 2009b; Miralles & Carranza 2010). Finally, other higher-level groupings are not well-supported but overall show a nesting of Caribbean and Middle American species and lineages within a subfamily that has its roots in South America.

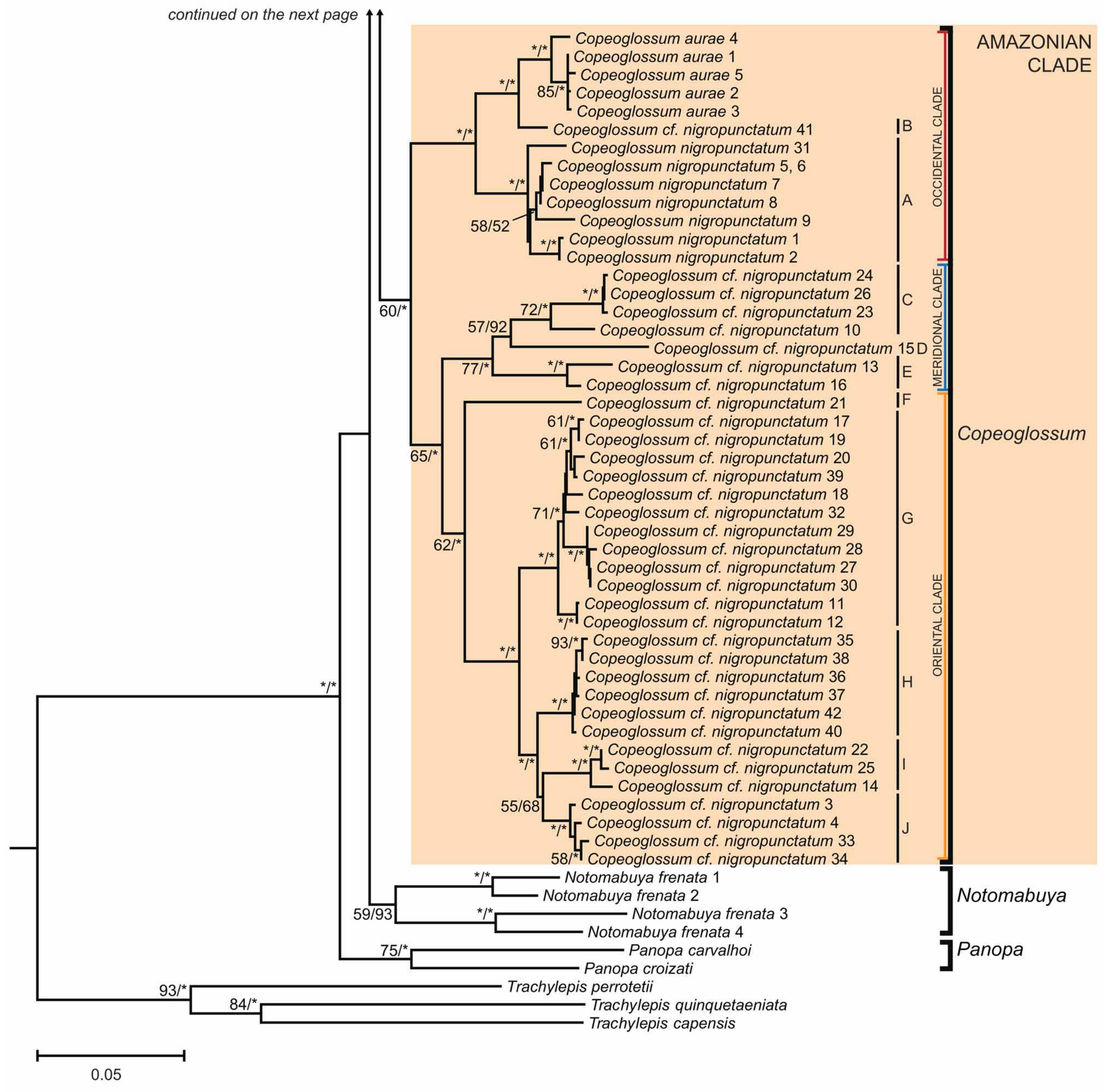
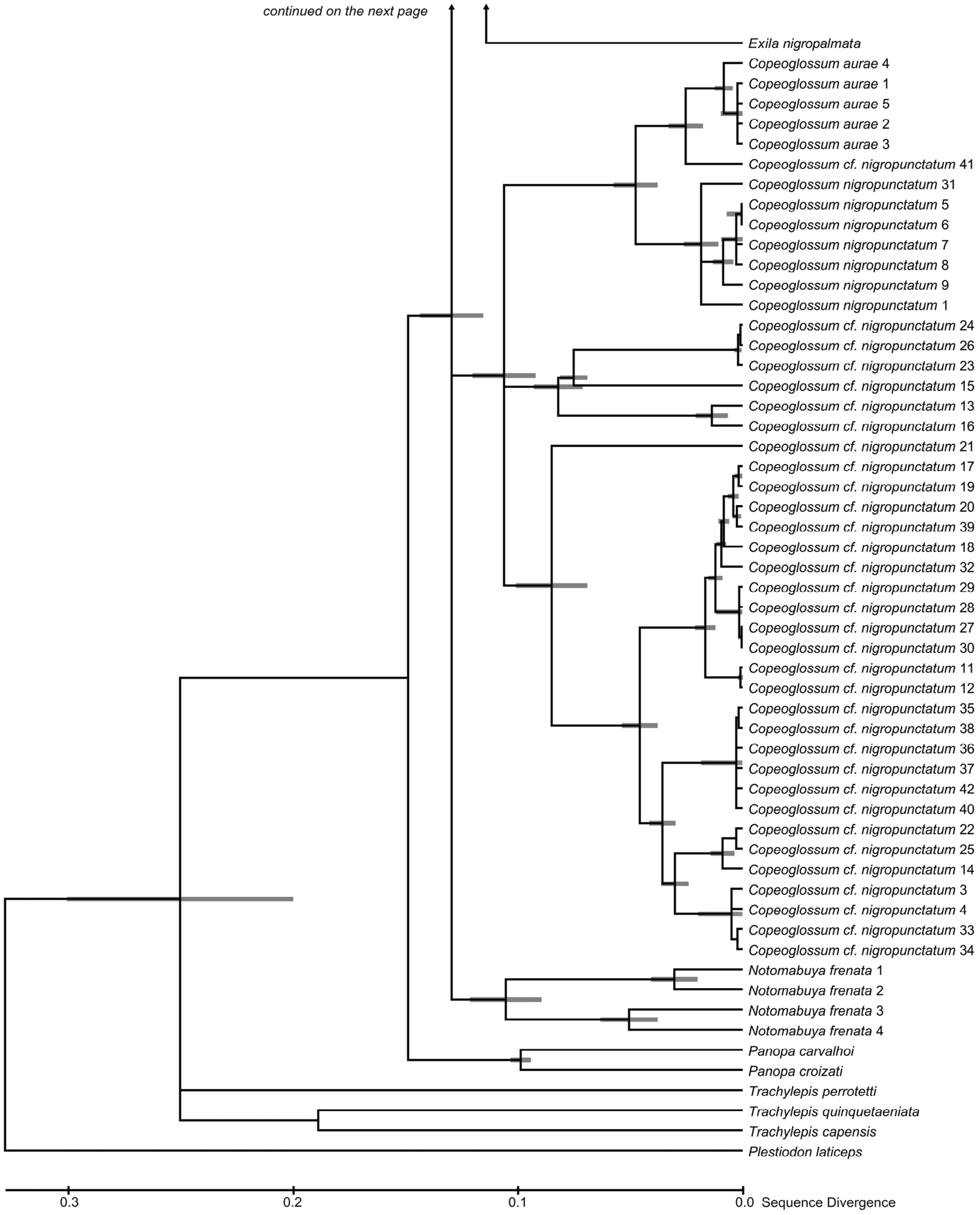


FIGURE 5 (continued on the next page)

FIGURE 5. Phylogenetic tree of Neotropical skinks (Mabuyidae, Mabuyinae) from a maximum-likelihood analysis of DNA sequences of three mitochondrial genes (12S rRNA, 16S rRNA, and cyt b) and one nuclear gene (myosin) in 126 individuals. Of those, 22 individuals (76 sequences) are new to this study and the others are from earlier studies (Carranza & Arnold 2003; Vrcibradic *et al.* 2006; Whiting *et al.* 2006; Miralles *et al.* 2009b; Miralles & Carranza 2010). Genera are indicated to the right, and a scale bar (5% sequence divergence) is indicated below. The numbers at nodes are bootstrap (left) and Bayesian (right) support values; asterisks indicate significant (≥ 95%) support, and a dash or no value indicates weak (< 50%) support. Not all genes are represented for all individuals (Appendix 1); therefore see Fig. 6 for unbiased sequence divergence. The tree is rooted with the North American *Plestiodon laticeps* (Scincidae sensu stricto; not shown).

The linearized tree of cytochrome b (Fig. 6) shows that some allopatric species in South America and on Caribbean islands are separated by only ~1–3% sequence divergence, which is low but not unusual within vertebrates (Johns & Avise 1998). Most sympatric species are from different genera, and two sympatric species in the Virgin Islands are separated by only 4% sequence divergence. On the other hand, many individuals currently assigned to the same species have levels of sequence divergence greater than 4%, with some exceeding levels of divergence (~10%) typical of different genera in this study. This would indicate that a large number of species,



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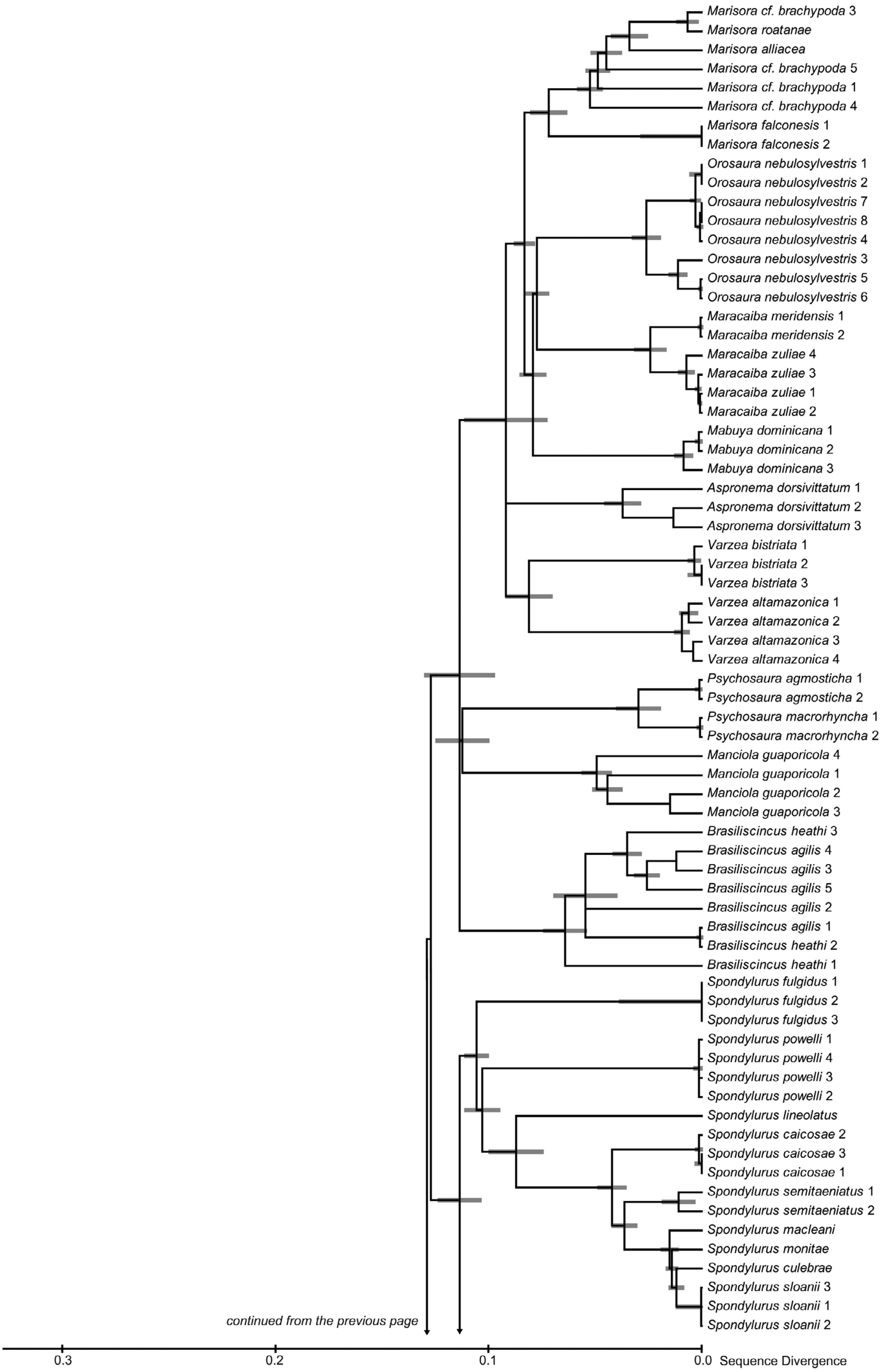
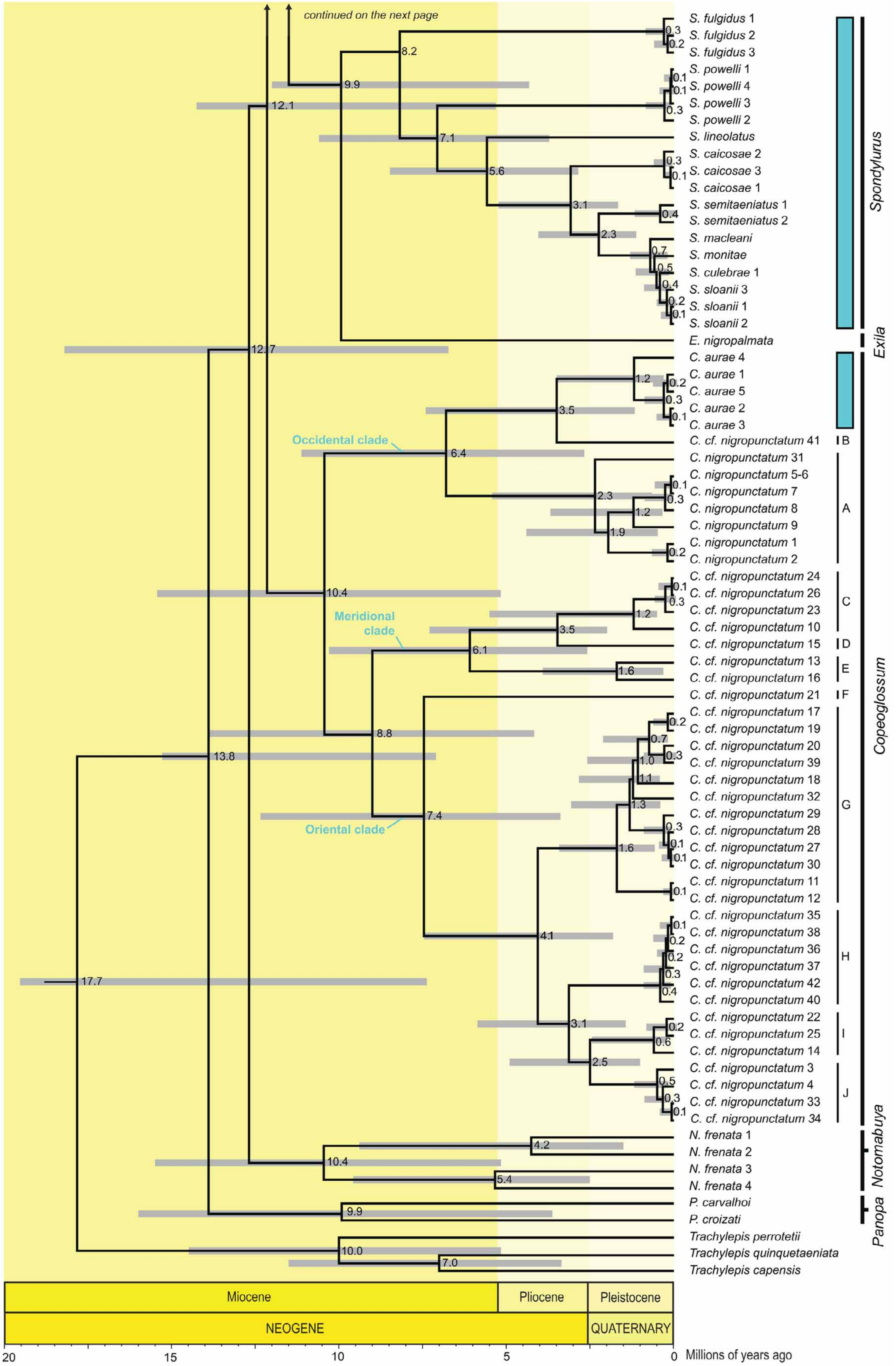


FIGURE 6. Phylogenetic tree of Neotropical skinks (Mabuyidae, Mabuyinae) showing linearized branch lengths (GTR + gamma + invariants) derived from sequences of the cytochrome b gene. A scale of pairwise sequence divergence is indicated below. The topology of the four-gene analysis (Fig. 5) was used, where cytochrome b sequences were present. Gray bars at nodes are 95% confidence intervals.



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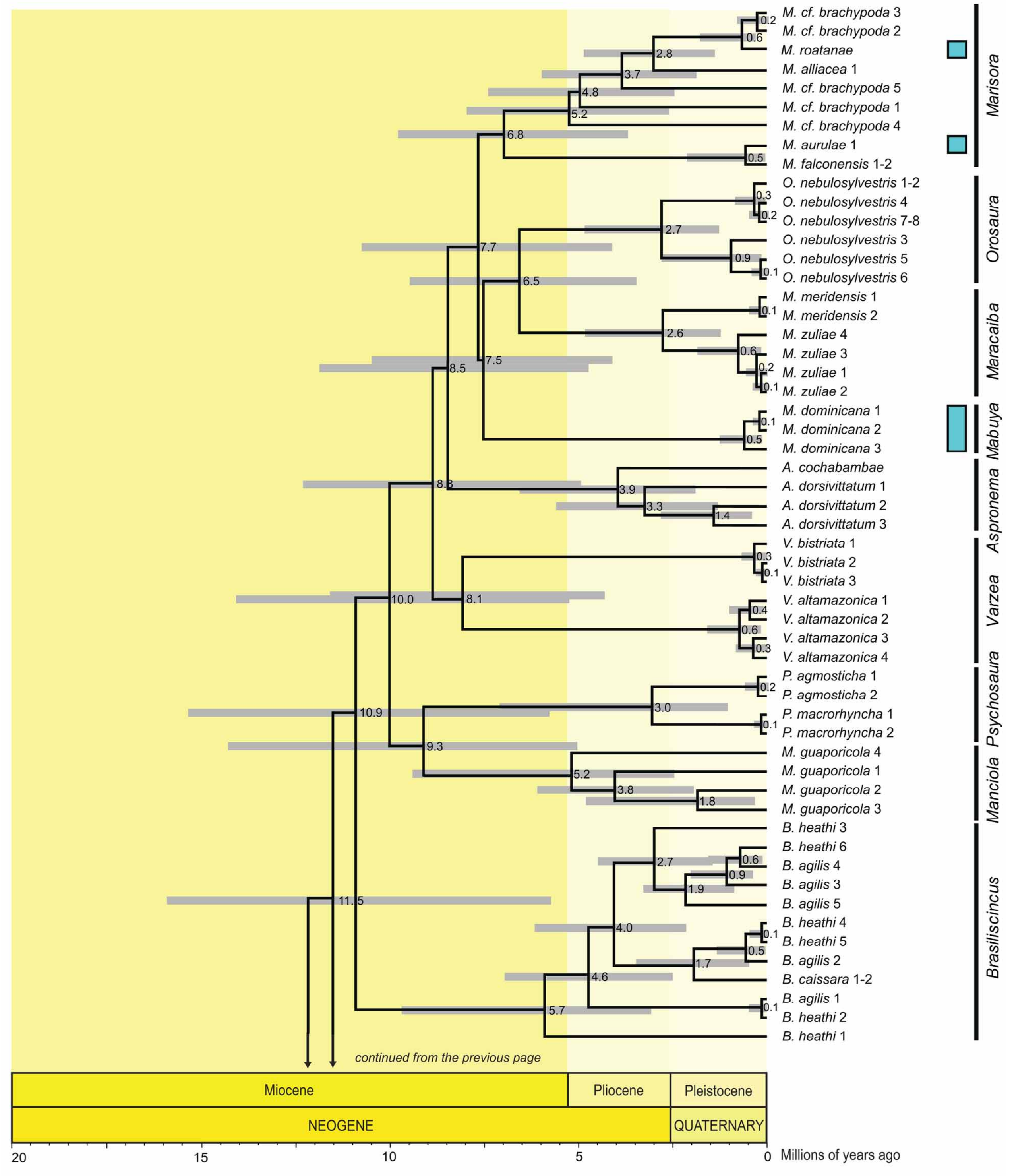

FIGURE 7. Timetree of Neotropical skinks (Mabuyidae, Mabuyinae) using the data and topology of the full (four-gene) data set from Fig. 5. Divergence times (indicated on nodes) are in millions of years and are averages of the results of two Bayesian analyses (independent and autocorrelated rates). Bayesian credibility intervals (gray bars) are composites of the intervals derived from the two analyses. Three African species (Mabuyidae, Trachylepidinae **subfam. nov.**) are included to estimate the time of the trans-Atlantic dispersal event. Blue vertical bars indicate taxa occuring on Caribbean islands.

especially from South America, remain to be described. Unfortunately, there is not a linear relationship between sequence divergence and time of divergence in cyt b, if the four-gene timetree (Fig. 7) can be used as a guide. The rate of change decreases from about 2% per million years 1–2 Ma to about 1.2% per million years 5–10 Ma, probably because of increased saturation (despite the use of complex models) with increasing divergence in this fast-evolving gene. For this reason, the use of common rates (percent per million years) to estimate divergence time

(Miralles & Carranza 2010) may result in biased estimates and a distorted timescale.

The molecular timetree (Fig. 7) uses the same four-gene data set and topology of Fig. 5. The time estimates are means of the two Bayesian analyses (independent and autocorrelated rate models), which differed by only 0.3 million years on average. Eliminating the Pliocene/Pleistocene calibration point (2.6 Ma), while keeping the other three, caused times to increase only slightly, about 0.5–0.9 million years (on average) and this effect, proportionately, was greatest in the most recent time estimates. The origin of the American lineage, from African relatives, was estimated to be 17.7 Ma, and the earliest split within South America was estimated to be 13.8 Ma. Divergences among genera were 13.8–6.5 Ma, while divergences of species within genera were 10.4–0.46 Ma.

Systematic Accounts

Order Squamata Oppel, 1811

Family Mabuyidae Mittleman, 1952

Subfamily Mabuyinae Mittleman, 1952

Neotropical Skinks

Type genus. *Mabuya* Fitzinger, 1826

Diagnosis. Mabuyid lizards with cylindrical bodies, four limbs, digits present (pentadactyl), smooth dorsal scales, no distinct boundary between gulars and ventrals, lower eyelid with semitransparent disc, 28–31 presacral vertebrae, no pterygoid teeth, no auricular lobules, smooth (not keeled) dorsal scales, and 24–36 scale rows around midbody (Mausfeld *et al.* 2002; Miralles *et al.* 2009a; data herein). Although placentotrophic viviparity has been mentioned as a diagnostic character for this group (Mausfeld *et al.* 2002; Miralles *et al.* 2010), it also occurs in some African species (Flemming & Blackburn 2003).

Content. Sixty-one species placed in 16 genera: *Alinea* **gen. nov.**, *Aspronema* **gen. nov.**, *Brasiliscincus* **gen. nov.**, *Capitellum* **gen. nov.**, *Copeoglossum*, *Exila* **gen. nov.**, *Mabuya*, *Manciola* **gen. nov.**, *Maracaiba* **gen. nov.**, *Marisora* **gen. nov.**, *Notomabuya* **gen. nov.**, *Orosaura* **gen. nov.**, *Panopa* **gen. nov.**, *Psychosaura* **gen. nov.**, *Spondylurus*, and *Varzea* **gen. nov.** (Table 1).

TABLE 1. Classification of lizards of the Family Mabuyidae, Subfamily Mabuyinae (61 species). Additional details on distribution are provided in the text.

Species	Distribution
Alinea berengerae (Miralles 2006); San Andrés Skink	San Andrés Island, Colombia
Alinea lanceolata (Cope 1862); Barbados Skink	Barbados
Alinea luciae (Garman 1887); Saint Lucia Skink	St. Lucia
Alinea pergravis (Barbour 1921); Providencia Skink	Isla de Providencia, Colombia
Aspronema cochabambae (Dunn 1935); Bolivian White-striped Skink	Bolivia
Aspronema dorsivittatum (Cope 1862); South American White-striped Skink	Northern Argentina, Bolivia, southern Brazil, Paraguay, & Uruguay
Brasiliscincus agilis (Raddi 1823); Atlantic Forest Small-headed Skink	Brazil
Brasiliscincus caissara (Reboucas-Spieker 1974); São Paulo Small-headed Skink	Brazil
Brasiliscincus heathi (Schmidt & Inger 1951); Caatinga Small-headed Skink	Brazil

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TABLE 1 (continued)

Species	Distribution
Capitellum mariagalantae **sp. nov.**; Marie-Galante Skink	Marie-Galante, Guadeloupe
Capitellum metallicum (Bocourt 1879); Lesser Martinique Skink	Martinique
Capitellum parvicruzae **sp. nov.**; Lesser Saint Croix Skink	St. Croix, U.S. Virgin Islands
Copeoglossum arajara (Reboucas-Spieker 1981); Caatinga Bronze Skink	Brazil
Copeoglossum aurae **sp. nov.**; Greater Windward Skink	St. Vincent, the Grenadines, Grenada, Trinidad, & Tobago.
Copeoglossum margaritae **sp. nov.**; Margarita Skink	Isla de Margarita, Venezuela
Copeoglossum nigropunctatum (Spix 1825); South American Spotted Skink	Eastern Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, & Venezuela
Copeoglossum redondae **sp. nov.**; Redonda Skink	Redonda
Exila nigropalmata (Andersson 1918); Amazonian Gracile Skink	Bolivia, southwestern Brazil, & southern Peru
Mabuya cochonae **sp. nov.**; Cochons Skink	Îlet à Cochons, Guadeloupe
Mabuya desiradae **sp. nov.**; Désirade Skink	La Désirade & Terre de Bas (Îles de la Petite Terre), Guadeloupe
Mabuya dominicana Garman, 1887; Dominica Skink	Dominica
Mabuya grandisterrae **sp. nov.**; Grande-Terre Skink	Grande Terre, Guadeloupe
Mabuya guadeloupae **sp. nov.**; Guadeloupe Skink	Basse-Terre, Guadeloupe
Mabuya hispaniolae **sp. nov.**; Hispaniolan Two-lined Skink	Hispaniola
Mabuya mabouya (Bonnaterre 1789); Greater Martinique Skink	Martinique
Mabuya montserratae **sp. nov.**; Montserrat Skink	Montserrat
Manciola guaporicola (Dunn 1935); Neotropical Small-handed Skink	Bolivia & Brazil
Maracaiba meridensis (Miralles *et al.* 2005b); Merida Skink	Venezuela
Maracaiba zuliae (Miralles *et al.* 2009); Maracaibo Skink	Venezuela
Marisora alliacea (Cope 1876); Costa Rican Four-lined Skink	Eastern Costa Rica & southeastern Nicaragua
Marisora aurulae **sp. nov.**; Lesser Windward Skink	St. Vincent, the Grenadines, Grenada, Trinidad, & Tobago.
Marisora brachypoda (Taylor 1956); Middle American Short-limbed Skink	Mexico, Belize, Guatemala, Honduras (including Utila & Guanaja islands), Nicaragua, & western Costa Rica
Marisora falconensis (Mijares-Urrutia & Arends 1997); Venezuelan Coastal Skink	Venezuela & Colombia
Marisora magnacornae **sp. nov.**; Corn Island Skink	Great Corn Island, Nicaragua
Marisora roatanae **sp. nov.**; Roatán Skink	Isla de Roatán, Honduras
Marisora unimarginata (Cope 1862); Middle American Long-limbed Skink	Western Costa Rica & Panama
Notomabuya frenata (Cope 1862); Southern Neotropical Skink	Argentina, Bolivia, Brazil, & Paraguay
Orosaura nebulosylvestris (Miralles *et al.* 2009); Venezuelan Cloud Forest Skink	Venezuela
Panopa carvalhoi (Reboucas-Spieker & Vanzolini 1990); Amazonian Blue-tailed Skink	Brazil & Venezuela

...... *continued on the next page*

TABLE 1 (continued)

Species	Distribution
Panopa croizati (Horton 1973); Turimiquire Blue-tailed Skink	Venezuela
Psychosaura agmosticha (Rodrigues 2000); Caatinga Sharp-nosed Skink	Brazil
Psychosaura macrorhyncha (Hoge 1946); Atlantic Forest Sharp-nosed Skink	Brazil
Spondylurus anegadae **sp. nov.**; Anegada Skink	Anegada, British Virgin Islands
Spondylurus caicosae **sp. nov.**; Caicos Islands Skink	Caicos Islands, Turks & Caicos
Spondylurus culebrae **sp. nov.**; Culebra Skink	Culebra & Culebrita, Puerto Rico
Spondylurus fulgidus (Cope 1862); Jamaican Skink	Jamaica
Spondylurus haitiae **sp. nov.**; Hispaniolan Four-lined Skink	Hispaniola
Spondylurus lineolatus (Noble & Hassler 1933); Hispaniolan Ten-lined Skink	Hispaniola
Spondylurus macleani (Mayer & Lazell 2000); Carrot Rock Skink	Carrot Rock, British Virgin Islands
Spondylurus magnacruzae **sp. nov.**; Greater Saint Croix Skink	St. Croix & Green Cay, U.S. Virgin Islands
Spondylurus martinae **sp. nov.**; Saint Martin Skink	St. Martin
Spondylurus monae **sp. nov.**; Mona Skink	Mona, Puerto Rico
Spondylurus monitae **sp. nov.**; Monito Skink	Monito, Puerto Rico
Spondylurus nitidus (Garman 1887); Puerto Rican Skink	Cayo Luis Peña, Cayo Norte, Culebra, Desecheo, Icacos, Puerto Rico, & Vieques
Spondylurus powelli **sp. nov.**; Anguilla Bank Skink	Anguilla, Dog Island, & St. Barts
Spondylurus semitaeniatus (Wiegmann 1837); Lesser Virgin Islands Skink	U.S. Virgin Islands, including Capella Island, Little Buck Island, and St. Thomas; British Virgin Islands including Fallen Jerusalem, Ginger Island, Great Camanoe Island, Guana Island, Little Thatch Island, Mosquito Island, Necker Island, Round Rock, Salt Island, Tortola Island, and Virgin Gorda
Spondylurus sloanii (Daudin 1803); Virgin Islands Bronze Skink	U.S. Virgin Islands, including Capella Island, Little Buck Island, Little Saba Island, Water Island, and St. Thomas; British Virgin Islands including Little Tobago Island, Norman Island, Peter Island, and Salt Island.
Spondylurus spilonotus (Wiegmann 1837); Greater Virgin Islands Skink	St. Thomas & St. John, U. S. Virgin Islands
Spondylurus turksae **sp. nov.**; Turks Islands Skink	Grand Turk Island & Gibbs Cay, Turks & Caicos
Varzea altamazonica (Miralles *et al.* 2006); Upper Amazon Floodplain Skink	Bolivia, Peru
Varzea bistriata (Spix 1825); Lower Amazon Floodplain Skink	Brazil, & French Guiana

Distribution. Mabuyinae is restricted to the Western Hemisphere (Americas) and is distributed from central Mexico (Colima in the west and Veracruz in the east) throughout Middle America and South America (primarily east of the Andes) as far south as central Argentina and Uruguay (Fig. 8). Most (38 species) of the currently known species of Mabuyinae are distributed only on islands in the Caribbean: the Turks and Caicos Islands, Jamaica, Hispaniola, the Puerto Rico Bank and region (including Mona, Monito, and St. Croix), the Lesser Antilles, Trinidad, Tobago, Isla de Margarita, Great Corn Island, Isla de San Andrés, and Isla de Providencia (Figs. 1, 9–11; no localities on the latter three islands are known with precision and therefore they are not individually mapped).

Most species are lowland, occurring below 1000 m, but four species (unrelated) occur primarily above 1000 m, with one of those reaching nearly 4000 m (Miralles *et al.* 2009b).

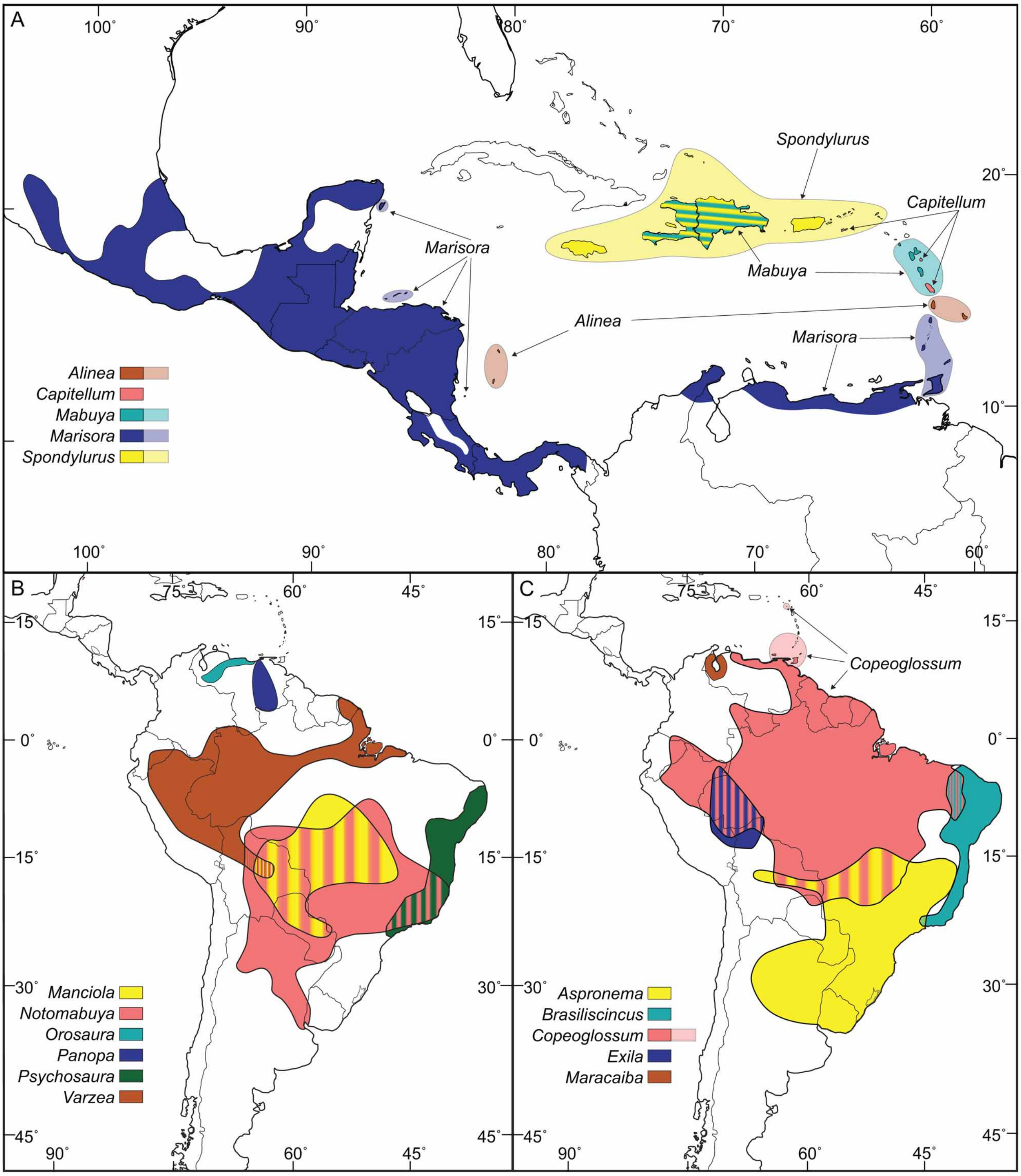

FIGURE 8. Distribution of the 16 genera of Neotropical skinks, Family Mabuyidae, Subfamily Mabuyinae. (A) Genera occurring in the greater Caribbean region. (B) Genera occurring exclusively in South America. (C) Additional genera occurring in South America, including one with representatives on Caribbean islands.

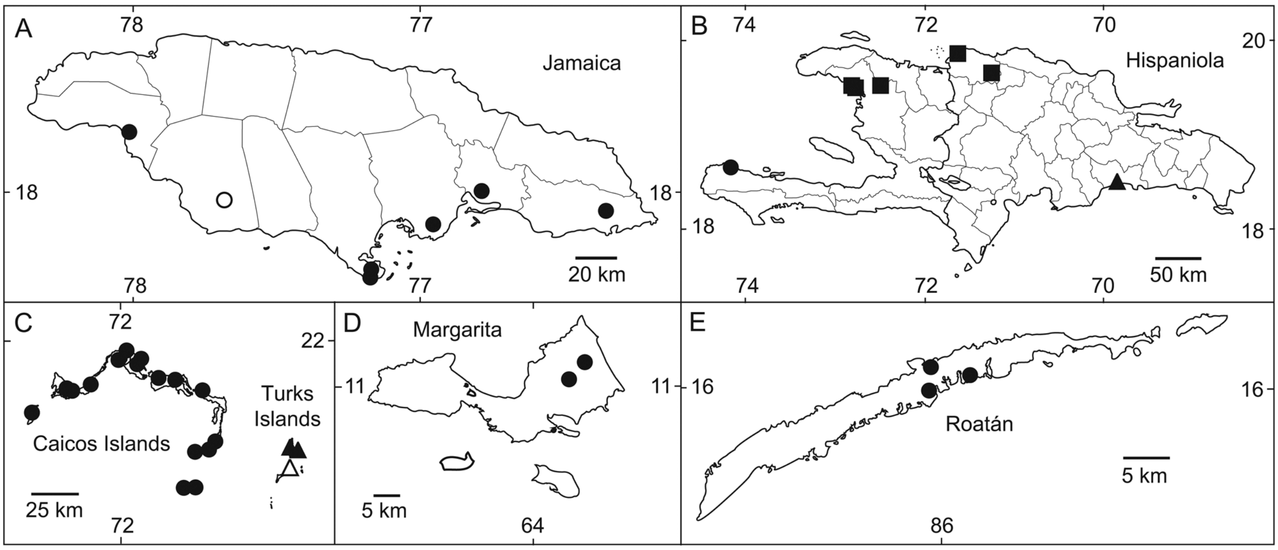

FIGURE 9. Map showing the distribution of mabuyine skinks occurring on islands in the central, southern, and western Caribbean region. See Fig. 1 for location of the islands. The islands and species are: (A) Jamaica (*Spondylurus fulgidus*; hollow circle = specimen not examined); (B) Hispaniola (*Spondylurus haitiae* **sp. nov.**, circle; *Mabuya hispaniolae* **sp. nov.**, triangle; *Spondylurus lineolatus*, squares); (C) Turks and Caicos Islands (*Spondylurus caicosae* **sp. nov.**, circles; *Spondylurus turksae* **sp. nov.**, triangles; hollow triangle is Cotton Cay record (see text); (D) Margarita (*Copeoglossum margaritae* **sp. nov.**); and (E) Roatán (*Marisora roatanae* **sp. nov.**).

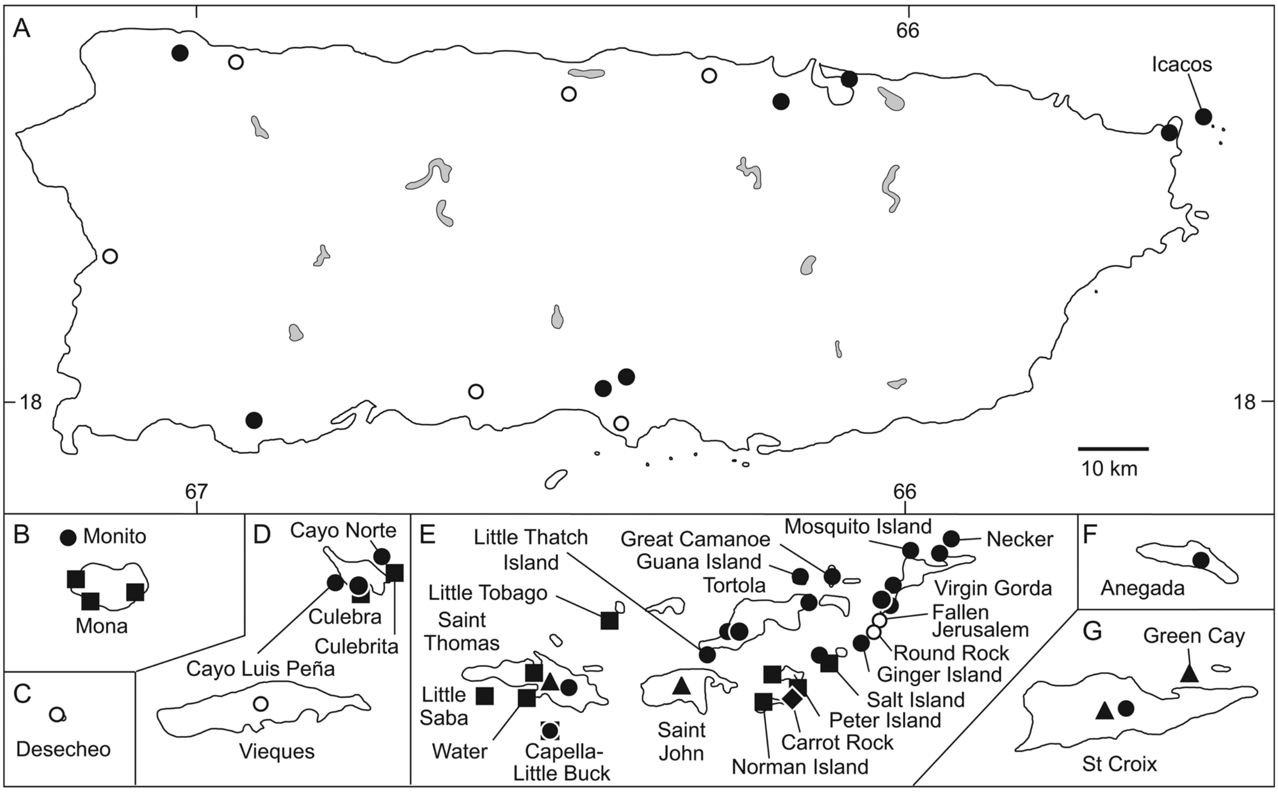

FIGURE 10. Map showing the distribution of mabuyine skinks occurring on islands in the greater Puerto Rico region. See Figure 1 for location of the islands. The islands and species are: (A) Puerto Rico (*Spondylurus nitidus*); (B) Mona (*Spondylurus monae* **sp. nov.**, squares) and Monito (*Spondylurus monitae* **sp. nov.**, circle); (C) Desecheo (*Spondylurus nitidus*); (D) Vieques (*Spondylurus nitidus*, circle), Culebra (*Spondylurus nitidus*, circles; *Spondylurus culebrae* **sp. nov.**, squares), Cayo Luis Peña and Cayo Norte (*S. nitidus*, circles); (E) most of the U.S. and British Virgin Islands (*Spondylurus macleani*, diamond; *Spondylurus sloanii*, squares; *Spondylurus semitaeniatus*, circles; *Spondylurus spilonotus*, triangles); (F) Anegada (*Spondylurus anegadae* **sp. nov.**); and (G) St. Croix and Green Cay (*Capitellum parvicruzae* **sp. nov.**, circle; *Spondylurus magnacruzae* **sp. nov.**, triangles). Hollow symbols are literature records (specimens not examined). Symbols on Vieques, St. Thomas, St. John, and St. Croix are placed centrally because no specific localities are known for those specimens from those islands. The scale in (A) applies to all islands.

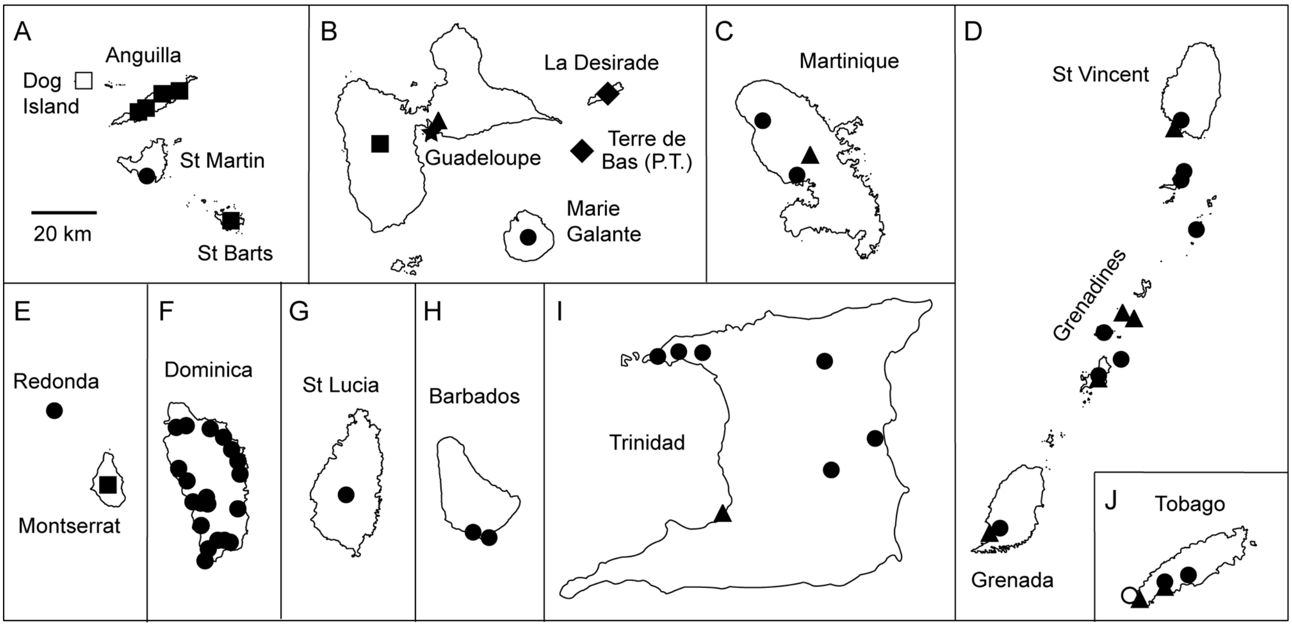

FIGURE 11. Map showing the distribution of mabuyine skinks occurring in the Lesser Antilles and Trinidad and Tobago. See Fig. 1 for location of the islands. The islands and species are: (A) Anguilla, Dog Island, and St. Barts (*Spondylurus powelli* **sp. nov.**, squares), and St. Martin (*S. martinae* **sp. nov.**, circle); (B) Guadeloupe: Basse-Terre (*Mabuya guadeloupae* **sp. nov.**, square), Grande-Terre (*Mabuya grandisterrae* **sp. nov.**, triangle), Îlet à Cochons (*Mabuya cochonae* **sp. nov.**, star), La Désirade and Terre de Bas, Petite-Terre (*Mabuya desiradae* **sp. nov.**, diamonds), and Marie-Galante (*Capitellum mariagalantae* **sp. nov.**, circle); (C) Martinique (*Mabuya mabouya*, circles; *Capitellum metallicum*, triangle); (D) St. Vincent, the Grenadines, and Grenada (*Copeoglossum aurae* **sp. nov.**, circles; *Marisora aurulae* **sp. nov.**, triangles); (E) Redonda (*Copeoglossum redondae* **sp. nov.**, circle) and Montserrat (*Mabuya montserratae* **sp. nov.**, square); (F) Dominica (*Mabuya dominicana*); (G) St. Lucia (*Alinea luciae*), (H) Barbados (*Alinea lanceolata*); (I) Trinidad (*Copeoglossum aurae* **sp. nov.**, circles; *Marisora aurulae* **sp. nov.**, triangle), and (J) Tobago (*Copeoglossum aurae* **sp. nov.**, circles; *Marisora aurulae* **sp. nov.**, triangles). Hollow symbols in A and J are literature records (specimens not examined). Where no specific localities within an island are known for a species, a symbol is placed centrally on the island: *Alinea luciae*, *Capitellum mariagalantae*, *Capitellum metallicum*, and *Copeoglossum redondae* **sp. nov.** The scale in (A) applies to all islands.

Etymology. The subfamily name Mabuyinae is derived from the Genus *Mabuya* Fitzinger (1826), which is in turn the name used by native peoples of the Americas, especially the Antilles, for various types of lizards.

Remarks. Skinks have been placed in one of the earliest-branching families of squamates, Scincidae Oppel (1811; see comment below), splitting from other scinciformatan families at 170 Ma (Hedges *et al.* 2009). That is twice as old as the mean age (84 million years) and nearly three times the modal age (67 million years) of any squamate family lineage (Hedges & Kumar 2009). The divergence times of the informal groups of lygosomine skinks (the *Egernia*, *Eugongylus*, *Lygosoma*, *Mabuya*, and *Sphenomorphus* groups; Skinner *et al.* 2011) are comparable to divergences among squamate families. Scincidae (sensu lato) is also the largest of the 26 families of lizards, containing more than one-quarter (27%; 1,503 species) of the 5,537 known lizard species (Uetz *et al.* 2011). As a result, skink genera and higher taxa have become too large to be manageable, inhibiting taxonomic revision and description of new species (e.g., species comparisons are simpler for a small genus than for a large genus). At the same time, phylogenetic studies have shown significant support for informal groups and higher-level taxa (Honda *et al.* 2000; Reeder 2003; Honda *et al.* 2003; Austin & Arnold 2006; Skinner *et al.* 2011). Considering all of this, it is appropriate at this time to make taxonomic adjustments to facilitate skink systematics. We recognize seven families of skinks, with content corresponding to the currently recognized subfamilies Acontinae and Scincinae, and those five informal groups of Lygosominae (type genera in parentheses): Acontidae Gray, 1839 (*Acontias* Cuvier 1817); Egerniidae Welch, 1982 (*Egernia* Gray 1838b); Eugongylidae Welch, 1982 (*Eugongylus* Fitzinger 1843); Lygosomidae Mittleman, 1952 (*Lygosoma* Hardwicke & Gray 1827); Mabuyidae Mittleman, 1952 (*Mabuya* Fitzinger 1826); Scincidae Oppel, 1811 (*Scincus* Laurenti 1768); and Sphenomorphidae Welch, 1982 (*Sphenomorphus* Fitzinger 1843). Lampropholiini Welch (1982) and Panaspiini Welch (1982) are both placed in the synonymy of Eugongylidae.

The authorship of the Family Scincidae has been ambiguous (Speybroeck *et al.* 2010), being attributed to either Oppel (1811) or Gray (1825). Both authors were explicit in proposing a family group name for *Scincus* but used spellings different from that which is currently used for the family. Regardless of those spellings, and following either ICZN Article 29.5 or the Law of Priority, we consider Oppel (1811) to be the author. We agree with Skinner *et al*. (2011) in placing Feyliniidae Camp (1923) in the synonymy of Scincidae (sensu stricto). Under this arrangement, and considering the relationships of the families (Skinner *et al*. 2011), we erect the Superfamily Lygosomoidea for the families Egerniidae, Eugongylidae, Lygosomidae, Mabuyidae, and Sphenomorphidae. We consider the Infraorder Scincomorpha Camp (1923) to contain only the seven families of skinks. At a higher level (Vidal & Hedges 2009), the Suborder Scinciformata Vidal & Hedges (2005) includes the Scincomorpha + Cordylomorpha; the latter taxon includes Cordylidae Mertens (1937), Gerrhosauridae Boulenger (1884), and Xantusiidae Baird (1859). This proposed rearrangement now provides more taxonomic "room" for partitioning, organizing, and better managing the great diversity of skink species.

Within the Family Mabuyidae, formal and informal suprageneric groups have been recognized based on morphological and molecular data over the past four decades (Greer 1970a, b; Greer 1979; Honda *et al.* 2000; Mausfeld *et al.* 2002; Mausfeld & Vrcibradic 2002; Carranza & Arnold 2003; Honda *et al.* 2003; Jesus *et al.* 2005; Austin & Arnold 2006; Miralles *et al.* 2011; Skinner *et al.* 2011). Knowledge of mabuyid phylogeny has increased sufficiently such that a more structured and formal taxonomy of this large family (formerly the *Mabuya* Group) is warranted. Family group names (subfamilies and tribes) have been used for some clades in the past, and we propose that the subfamily rank be used for them, in addition to the Subfamily Mabuyinae for the group under study here. Those subfamilies include, along with their former informal group name and type genus (for new taxa): Chioniniinae **subfam. nov.** (Cape Verde Skinks, *Chioninia* Gray 1845), Dasiinae **subfam. nov.** (Asian *Mabuya* Group, *Dasia* Gray 1839), and Trachylepidinae **subfam. nov.** (African *Mabuya* Group, *Trachylepis* Fitzinger 1843). Taxonomic content, as well as morphological and molecular support for each of these taxa, are included in the studies cited above.

The Subfamily Mabuyinae is a monophyletic and well-defined group including all members of what was previously the Genus *Mabuya*, a clade of American skinks (Mausfeld *et al.* 2002; Miralles & Carranza 2010). Moreover, we have identified 16 clades within Mabuyinae that can be defined by molecular and morphological evidence. Most of these clades were already identified in earlier molecular phylogenies (Vrcibradic *et al.* 2006; Whiting *et al.* 2006; Miralles *et al.* 2009b; Miralles & Carranza 2010). Some have been recognized informally as species groups and "complexes" in the past (and in two cases, genera), but the membership of these groups has come into focus. Giving them formal taxonomic recognition now is appropriate. Initially we considered the rank of subgenus but realized that the number of species (61) would place the genus among the largest genera of skinks; i.e., those likely to be partitioned into multiple genera in the near future. We also considered that dozens of additional species are likely to be described from Central and South America in coming years, based on molecular phylogenies indicating the presence of undescribed species (Miralles *et al.* 2009b; Miralles & Carranza 2010; and analyses herein). Moreover, time estimates among the American clades (see below) are comparable to those among skink genera in other parts of the world (Skinner *et al.* 2011). It is also normal taxonomic practice to create superspecific taxa in order to organize biodiversity, especially, as in this case, when many new species are added to a genus (Simpson 1961). While it is true that new binomials necessitate some changes in databases and guides, partitioning of large genera is beneficial for systematic work because it creates manageable taxa for study. Thus, for all of these reasons we have chosen to recognize these clades at the generic level.

There is one species name within Mabuyinae that we must address here: *Tiliqua albolabris* (Gray 1838b). The name is based on a single specimen of unknown locality, presumably from the Americas. It was synonymized in "*Mabouya agilis*" only a few years later by the original author (Gray 1845), and then placed under "*Mabuia aurata*" (= *Trachylepis aurata*) by Boulenger (1887:189). Dunn (1936) placed it in the synonymy of his wide-ranging "*Mabuya mabouya*" distributed through much of the Americas. Otherwise the name has been conspicuously absent from the literature, including synonymies and the latest databases (Uetz *et al.* 2009). The original description is but a single sentence that says, "Golden-green with a brown streak on each side [of] the head and body (enclosing the eyes and ears) edged above and below with a pale streak; lips white; tail elongate" (Gray 1838:292). This short description is consistent with many species of mabuyines. However, the holotype (the only known specimen) of *Tiliqua albolabris* is presumed lost (Colin McCarthy, BMNH, personal communication). Neither Boulenger (1891) nor Dunn (1936) examined the type, so it may have become lost soon after it was described by Gray (1838). Without a specimen, figure, locality, or useful (diagnostic) description, the name is a *nomen nudum*.

Genus *Alinea* gen. nov.

Caribbean Stripeless Skinks

Type species. *Mabuya lanceolata* Cope, 1862:187.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 4–5, (3) supraoculars, four, (4) prefrontal contact, absent (rarely prefrontals in point contact in *Alinea luciae*), (5) parietal contact, present, (6) rows of nuchals, 1–3, (7) dorsals + ventrals, 116–136, (8) total digital lamellae, 231–259, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent, (11) a dark lateral stripe, absent (weakly visible, anteriorly, in *A. berengerae*), and (12) dark ventral stripes, present (*A. lanceolata* and *A. luciae*). Maximum body sizes in this genus range from 60–109 mm SVL (Table 2).

TABLE 2. Taxonomic summary for lizards of the Subfamily Mabuyinae. For each genus, the number of species, occurrence on islands, and sample size, are shown along with the primary diagnostic characters used in distinguishing the genera. See individual accounts for additional diagnostic characters specific to each genus. Sample size is listed separately (in parentheses) for total lamellae. Sample size indicates specimens examined, except for *Orosaura* and *Exila* where data are from the literature (see accounts). N = no, Y = yes. Rare or uncommon states given in parentheses.

Genus	Number of species	Caribbean Islands	Sample Size	Fronto-parietals	Supra-ciliaries	Supra-oculars
Alinea	4	Y	n = 15	2	4–5	4
Aspronema	2	N	n = 7	1–2	3–4	3 (4)
Brasiliscincus	3	N	n = 9	2	5–6	4
Capitellum	3	Y	n = 9	2	5–6	4
Copeoglossum	5	Y	n = 73	2	3–6	4 (3)
Exila	1	N	n = 9	1	5	4
Mabuya	8	Y	n = 94	2	4 (3, 5–6)	3 (2, 4)
Manciola	1	N	n = 2	2	4	4
Maracaiba	2	N	n = 1	2	4	4
Marisora	7	Y	n = 80	2 (3)	4 (3, 5–6)	4 (3)
Notomabuya	1	N	n = 9	1	4–6	4 (3, 5)
Orosaura	1	N	n = 31	2	4 (5–6)	4
Panopa	2	N	n = 4	1	4–6	4
Psychosaura	2	N	n = 1	2	4–5	4
Spondylurus	17	Y	n = 423	2 (1, 3)	4 (3, 5–6)	4 (2, 3)
Varzea	2	N	n = 6	2	4–5	4

Genus	Prefrontal contact	Parietal contact	Nuchal rows	Dorsals + ventrals	Total lamellae
Alinea	N (Y)	Y	1–3	116–136	231–259 (4)
Aspronema	N (Y)	Y	0–2	111–132	185–193 (4)
Brasiliscincus	N	Y	1	113–124	157–194 (5)
Capitellum	N	Y, N	1	125–128	167–190 (3)
Copeoglossum	N (Y)	N (Y)	1 (0)	105–120	196–253 (17)

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TABLE 2. (continued)

Genus	Prefrontal contact	Parietal contact	Nuchal rows	Dorsals + ventrals	Total lamellae	
Exila	Y	Y	2–3	unknown	unknown	
Mabuya	N (Y)	Y	1 (2)	116–138	211–253 (32)	
Manciola	N (Y)	Y	1	136–141	147–154 (2)	
Maracaiba	N (Y)	Y (N)	1	127	Unknown	
Marisora	N (Y)	Y (N)	1 (2)	109–131	184–229 (16)	
Notomabuya	N (Y)	Y (N)	1	111–130	217–228 (3)	
Orosaura	N	Y (N)	1	unknown	Unknown	
Panopa	Y	Y	3–5	115–126	191–209 (3)	
Psychosaura	N	Y	1–2	114	201 (1)	
Spondylurus	N (Y)	Y (N)	2 (1, 3)	108–135	159–238 (40)	
Varzea	Y, N	Y	1	116–126	208 (1)	
Genus	**Dark middorsal stripe**	**Dark dorsolateral stripe**	**Dark lateral stripe**	**Dark ventral stripes**	**Palm and sole color**	**Maximum adult SVL (mm)**
Alinea	N	N	N (Y)	Y, N	pale, dark	60–109
Aspronema	Y	Y	Y	N	pale, dark	76–84
Brasiliscincus	N	Y (N)	Y	N	pale	69–86
Capitellum	N	N	Y	N	dark	68–78
Copeoglossum	N	N	Y	N	pale, dark	91–121
Exila	N	N	Y	N	dark	60
Mabuya	N	N (Y)	Y	N	dark	93–106
Manciola	Y	Y	Y	N	pale	98
Maracaiba	Y, N	Y, N	Y	N	dark	77–101
Marisora	N	N (Y)	Y	N	pale, dark	82–95
Notomabuya	N	N	Y	N	pale	91
Orosaura	N	?	Y	N	dark	97
Panopa	N	Y	Y	N	pale, dark	69–76
Psychosaura	N	Y	Y	N	dark	74–85
Spondylurus	N	Y	Y	N	pale, dark	64–107
Varzea	N	Y (N)	Y	N	pale, dark	97

Although each character is not present in all four species, the combination of multiple rows of nuchals, high total digital lamellae counts (> 230), elongate bodies, ventral stripes, and lack of dorsal stripes distinguishes *Alinea* from other genera. The high lamellae counts alone distinguish this genus from all genera except *Copeoglossum*, *Mabuya*, and *Spondylurus* (only one species of *Spondylurus*, *S. fulgidus*, has such high counts). *Alinea* differs from *Copeoglossum* in having contact (versus usually no contact) between parietals. In having four supraoculars, *Alinea* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). It differs from *Spondylurus* (and most other genera) in lacking dark dorsolateral and lateral stripes.

Content. Four species are placed in this genus: *Alinea berengerae*, *A. lanceolata*, *A. luciae*, and *A. pergravis* (Table 1).

Distribution. The genus is distributed in the Lesser Antilles (on the islands of Barbados and St. Lucia) and on the western Caribbean islands of Isla de San Andrés and Isla de Providencia (Figs. 1, 8A, and 11G–H).

Etymology. The generic name *Alinea* is a feminine noun derived from the Latin and Greek prefix *a-* (away from, without) and the Latin noun *linea* (line), referring to the absence of lines on the dorsum of species in this genus.

Remarks. Miralles (2006a) considered *Alinea berengerae* to be closely related to *A. pergravis* based on an "extremely elongate and pointed" snout. In part, that is correct; the snouts are more acuminate than other species when viewed from above and laterally. Their snouts and heads are long (~18–19% SVL) but not exceptionally so in the subfamily.

Barbour (1921) saw Old World affinities in *Alinea pergravis*, but Dunn and Saxe (1950) noted similarities between *A. pergravis* (*A. berengerae* had not yet been described) and species in the southern Lesser Antilles. They used this to argue against an origin for *A. pergravis* from the geographically closer landmass of Central America. Besides the absence of distinct body stripes in *A. pergravis* and skinks from Barbados, they also mentioned high ventral scale counts. However, the ventral scale counts of *Alinea* (except for *A. pergravis*) are not especially high compared with other genera. Further building a Lesser Antillean connection with *A. pergravis*, they noted that water currents will carry a ship from the southern Lesser Antilles to Providencia and gave historical accounts as evidence. Miralles *et al.* (2009), on the other hand, did not agree with a Lesser Antillean connection and instead associated *A. berengerae* and *A. pergravis* with a complex of species in middle and northern South America. We concur with the explanation of Dunn and Saxe (1950) for the origin of *A. pergravis* (and *A. berengerae*) based on the diagnostic characters that join them with *A. lanceolata* and *A. luciae* and the direction of current flow in the Caribbean (Hedges 1996b).

Climbing behavior has been noted in one species (*Alinea pergravis*; Dunn & Saxe 1950), and it is likely a characteristic of its close relative *A. berengerae*. Given the elongate bodies of all four species and their high digital lamellae counts (a functional correlate of climbing), the behavior may even be characteristic of the Genus *Alinea*. Three of the species (all except *A. pergravis*) are known from only one or a few individuals. No specimens of any of the four species have been taken in recent years, and they are here considered to be Critically Endangered.

Alinea berengerae **(Miralles 2006) comb. nov.**

San Andrés Skink
(Figs. 12A, 13A, 14)

Mabuya berengerae Miralles, 2006:2. Holotype: UMMZ 127884, an adult (not sexed), collected 6 August 1967 on San Andrés Island (between Morgan's Cave and Punta Sur), Colombia, by C. F. Walker.

Material examined (n = 1). San Andrés Island, Colombia. UMMZ 127884 (holotype), an unsexed adult, collected on San Andrés Island, Colombia, by C. F. Walker, 1967. The only known specimen.

Diagnosis. *Alinea berengerae* is characterized by (1–2; the holotype, the only known specimen, was not sexed in the original description) SVL, 59.5 mm; (3) snout width, 2.55% SVL; (4) head length, 19.0% SVL; (5) head width, 11.9% SVL; (6) ear length, 1.43% SVL; (7) toe-IV length, 12.8% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, six; (13) nuchal rows, one (see Remarks); (14) dorsals, 59; (15) ventrals, 65; (16) dorsals + ventrals, 124; (17) midbody scale rows, 28; (18) finger-IV lamellae, 14; (19) toe-IV lamellae, 19; (20) finger-IV + toe-IV lamellae, 33; (21) supranasal contact, Y; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y (weakly visible, anteriorly); (28) pale lateral stripe, N; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Alinea*, it is distinguished from *A. lanceolata* by having fewer midbody scale rows (28 versus 30–32), a longer head (head length 19.0% versus 16.3–17.8% SVL), longer toes (toe-IV length 12.8% versus 9.25–10.8% SVL), an attenuate body shape (non-attenuate in *A. lanceolata*), and absence of ventral striping. From *A. luciae*, it is distinguished by having supralabial six (versus five) below the eye, a higher number of dorsals (59 versus 54–57), an attenuate body shape (not attenuate in *A. luciae*), and an absence of ventral striping. From *A. pergravis*, it differs by having fewer dorsals (59 versus 62–63), fewer ventrals (65 versus 70–73), and fewer combined dorsals and ventrals (124 versus 132–136).

TABLE 3. Summary of the primary diagnostic characters, related to body proportions, used in distinguishing the 39 species of mabuyine lizards from Caribbean islands. All species are endemic to Caribbean islands, except *Marisora brachypoda*, which also occurs on the mainland. See individual accounts for additional diagnostic characters specific to each species. F = female; M = male; L = length; W = width; NA = not applicable (or measurement not available).

Species	Sample size	Max. SVL (mm), females	Max. SVL (mm), males	Max. Mass (g)	Head L (mm)	Head L (% SVL)
Alinea berengerae	n = 1	59.5 (unsexed)	NA	3.6	11.3	19.0
Alinea lanceolata	n = 3	93.8	82.2	14.2	11.6–15.3	16.3–17.8
Alinea luciae	n = 5	109	NA	21.2	18.3–19.0	17.5–18.4
Alinea pergravis	n = 6	90.9	87.7	12.9	15.6–16.7	17.5–19.2
Capitellum mariagalantae	n = 7	78.3	NA	8.2	12.4	15.8
Capitellum metallicum	n = 1	74	NA	6.9	11.5	15.5
Capitellum parvicruzae	n = 1	68.1	NA	5.4	11.1	16.3
Copeoglossum aurae	n = 33	109	98.5	22.4	12.2–18.1	16.3–20.7
Copeoglossum margaritae	n = 3	121	NA	30.7	20.3	17.1
Copeoglossum redondae	n = 1	100.1	NA	17.3	16.1	16.1
Mabuya cochonae	n = 2	98	96.7	16.2	18.3–18.5	18.7–19.1
Mabuya desiradae	n = 2	NA	98.1	16.3	17.4–18.6	18.5–19.0
Mabuya dominicana	n = 57	101	92.3	17.8	12.6–17.2	16.4–20.9
Mabuya grandisterrae	n = 5	102.1	90.8	18.4	12.6–17.6	17.2–19.8
Mabuya guadeloupae	n = 3	106	94.3	20.6	16.3–17.4	16.4–17.3
Mabuya hispaniolae	n = 8	92.6	86.6	13.7	16.0–16.4	17.7–19.2
Mabuya mabouya	n = 9	101.2	83.9	17.9	15.7–19.4	16.2–19.4
Mabuya montserratae	n = 8	98	85.3	16.2	15.1–16.8	17.1–18.6
Marisora aurulae	n = 15	89	80.9	12.1	11.7–15.2	16.7–19.1
Marisora brachypoda	n = 36	79.4	85.7	10.8	10.4–14.9	14.9–21.1
Marisora magnacornae	n = 1	NA	77.4	7.9	14.4	18.6
Marisora roatanae	n = 2	90.2	74.7	12.6	14.2	15.7–19.0
Spondylurus anegadae	n = 38	70.4	67.8	6.0	8.72–11.5	15.4–18.6
Spondylurus caicosae	n = 99	77.6	72.4	8.0	9.35–12.2	15.0–18.5
Spondylurus culebrae	n = 50	97.6	88	16.0	12.9–16.2	16.0–21.6
Spondylurus fulgidus	n = 35	84.8	77	10.5	10.3–15.4	16.3–20.9
Spondylurus haitiae	n = 5	85.2	NA	10.6	13.5	15.8
Spondylurus lineolatus	n = 10	63.7	NA	4.4	7.38–8.64	12.9–14.4
Spondylurus macleani	n = 5	79.6	75.5	8.6	10.8–13.2	16.0–17.5
Spondylurus magnacruzae	n = 10	107	92.9	21.2	13.5–18.5	15.9–18.0
Spondylurus martinae	n = 9	83.1	NA	9.9	10.1–12.8	15.0–17.1
Spondylurus monae	n = 35	85	85.9	10.9	10.1–15.6	16.1–20.0
Spondylurus monitae	n = 7	94.5	90.3	14.5	14.4–16.1	16.2–17.8
Spondylurus nitidus	n = 16	95.5	87.1	15.0	9.29–16.0	16.6–20.7
Spondylurus powelli	n = 16	69.8	71.7	6.3	8.81–12.2	15.6–18.4
Spondylurus semitaeniatus	n = 54	82.9	74.7	9.8	9.64–13.7	15.8–19.4
Spondylurus sloanii	n = 23	88.9	68.2	12.1	10.3–13.8	15.2–19.2
Spondylurus spilonotus	n = 6	106.5	91.7	20.9	13.0–16.4	15.4–18.5
Spondylurus turksae	n = 7	79.1	79.3	8.5	11.3–12.6	15.2–16.5

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TABLE 3. (continued)

Species	Head W (mm)	Head W (% SVL)	Snout W (mm)	Snout W (% SVL)
Alinea berengerae	7.07	11.9	1.52	2.55
Alinea lanceolata	7.63–12.0	11.2–12.8	1.24–2.54	1.90–2.71
Alinea luciae	13.8–14.3	12.7–14.1	3.08–3.20	2.90–3.22
Alinea pergravis	9.78–10.8	10.8–12.8	2.25–2.69	2.65–3.07
Capitellum mariagalantae	9.66	12.3	2.00	2.55
Capitellum metallicum	8.52	11.5	1.78	2.41
Capitellum parvicruzae	8.83	13	2.07	3.04
Copeoglossum aurae	8.61–14.9	12.5–16.1	1.83–3.30	2.64–3.63
Copeoglossum margaritae	15.0	12.6	3.48	2.93
Copeoglossum redondae	14.1	14.1	2.89	2.89
Mabuya cochonae	12.5–12.7	12.8–13.1	2.63–2.69	2.68–2.78
Mabuya desiradae	12.8–13.3	13.6	2.41–2.81	2.56–2.86
Mabuya dominicana	8.54–13.4	11.5–15.4	1.79–2.80	2.41–3.45
Mabuya grandisterrae	8.82–12.8	12.5–13.9	1.58–2.95	2.34–3.44
Mabuya guadeloupae	11.2–12.7	11.6–12.0	2.63–3.13	2.63–2.99
Mabuya hispaniolae	10.7–12.1	11.6–14.0	2.78–2.96	3.08–3.47
Mabuya mabouya	11.6–13.3	12.1–14.9	2.37–2.97	2.52–3.23
Mabuya montserratae	10.7–12.1	12.3–13.2	2.70–2.74	2.80–3.33
Marisora aurulae	7.55–11.9	13.0–15.0	1.52–2.50	2.47–3.08
Marisora brachypoda	7.68–11.4	11.2–16.6	1.50–2.34	2.20–3.54
Marisora magnacornae	10.8	14.0	2.10	2.71
Marisora roatanae	10.5–11.4	12.6–14.1	2.15–2.21	2.38–2.96
Spondylurus anegadae	5.87–8.54	10.7–13.3	1.29–2.01	2.13–3.34
Spondylurus caicosae	6.69–10.4	10.9–14.8	1.23–2.33	2.14–3.66
Spondylurus culebrae	9.13–12.0	11.4–16.1	1.75–2.85	2.28–3.50
Spondylurus fulgidus	7.16–11.2	11.0–14.1	1.39–3.07	2.21–3.73
Spondylurus haitiae	10.5	12.3	2.29	2.69
Spondylurus lineolatus	5.92–6.61	9.58–11.6	1.10–1.49	1.97–2.34
Spondylurus macleani	8.67–10.4	12.1–13.8	1.73–2.33	2.47–3.09
Spondylurus magnacruzae	9.81–13.3	11.3–14.3	1.92–2.90	2.29–2.97
Spondylurus martinae	7.17–10.2	9.97–12.3	1.49–1.82	2.15–2.78
Spondylurus monae	6.90–11.3	11.1–13.9	1.36–2.95	2.25–3.58
Spondylurus monitae	10.7–12.5	11.5–13.8	2.20–2.85	2.42–3.16
Spondylurus nitidus	6.47–11.9	12.5–14.6	1.39–3.12	2.38–3.57
Spondylurus powelli	6.42–10.0	11.7–14.4	1.26–2.08	2.28–3.02
Spondylurus semitaeniatus	6.91–10.3	11.9–16.2	1.17–2.44	1.99–3.27
Spondylurus sloanii	7.68–11.9	11.8–13.9	1.37–2.50	2.10–3.11
Spondylurus spilonotus	9.60–12.9	12.0–13.9	2.08–2.97	2.74–3.05
Spondylurus turksae	8.35–10.3	12.0–13.0	1.71–2.74	2.42–3.69

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TABLE 3. (continued)

Species	**Ear L (mm)**	**Ear L (% SVL)**	**toe-IV L (mm)**	**toe-IV L (% SVL)**
Alinea berengerae	0.85	1.43	7.62	12.8
Alinea lanceolata	1.01–1.46	1.23–2.24	7.08–7.60	9.25–10.8
Alinea luciae	1.07	0.98	12.9	11.9
Alinea pergravis	1.35–1.61	1.54–1.84	10.4–10.8	11.4–13.2
Capitellum mariagalantae	1.66	2.12	7.45	9.52
Capitellum metallicum	1.13	1.53	7.85	10.6
Capitellum parvicruzae	0.94	1.38	7.09	10.4
Copeoglossum aurae	0.95–1.95	1.02–2.19	7.23–11.8	10.1–12.7
Copeoglossum margaritae	1.35	1.14	10.8	9.06
Copeoglossum redondae	2.42	2.42	9.44	9.43
Mabuya cochonae	1.00–1.08	1.02–1.12	10.9–11.2	11.1–11.6
Mabuya desiradae	1.38–1.42	1.45–1.47	9.57–10.2	10.2–10.4
Mabuya dominicana	0.68–1.59	0.77–1.82	7.48–10.7	8.91–13.4
Mabuya grandisterrae	1.14–1.45	1.26–2.08	7.71–10.9	10.2–12.8
Mabuya guadeloupae	1.36–1.74	1.28–1.82	8.84–9.30	8.77–9.72
Mabuya hispaniolae	0.96–1.25	1.11–1.46	9.45–9.92	10.7–11.1
Mabuya mabouya	1.05–1.60	1.09–1.91	9.72–11.0	10.2–12.5
Mabuya montserratae	1.32–1.46	1.49–1.55	9.32–9.71	9.51–11.4
Marisora aurulae	0.79–1.52	1.00–2.13	5.43–7.83	7.96–10.5
Marisora brachypoda	0.69–1.64	1.11–2.18	5.92–9.67	7.43–12.7
Marisora magnacornae	1.05	1.36	9.59	12.4
Marisora roatanae	0.82–1.43	0.95–1.15	7.57–7.86	8.39–10.5
Spondylurus anegadae	0.67–1.17	0.96–2.10	4.60–6.57	8.34–10.7
Spondylurus caicosae	0.73–1.45	1.06–2.10	5.28–7.92	7.86–12.2
Spondylurus culebrae	1.11–2.03	1.36–2.36	7.22–9.35	8.42–12.9
Spondylurus fulgidus	1.02–1.74	1.46–2.83	5.89–9.90	9.07–12.9
Spondylurus haitiae	1.01	1.19	7.68	9.01
Spondylurus lineolatus	0.75-0.95	1.18–1.69	4.51–5.26	7.23–9.16
Spondylurus macleani	0.83–1.17	1.29–1.52	5.90–7.11	8.22–10.5
Spondylurus magnacruzae	1.15–1.78	1.49–1.72	6.52–9.83	7.01–10.4
Spondylurus martinae	0.92–1.60	1.27–1.93	6.21–6.83	8.22–10.5
Spondylurus monae	0.95–1.77	1.23–2.26	5.18–8.15	8.09–10.4
Spondylurus monitae	1.20–1.50	1.35–1.59	7.60–8.84	8.34–10.7
Spondylurus nitidus	1.04–1.89	1.32–2.36	5.64–9.59	9.45–12.7
Spondylurus powelli	0.93–1.69	1.36–2.64	5.28–7.85	8.45–11.5
Spondylurus semitaeniatus	0.73–1.49	0.95–2.27	4.92–7.66	8.33–12.0
Spondylurus sloanii	0.74–1.34	1.12–1.73	5.60–8.02	8.05–11.2
Spondylurus spilonotus	1.35–1.89	1.76–2.05	6.82–8.29	7.30–10.5
Spondylurus turksae	0.92–1.26	1.30–1.81	5.58–6.45	7.05–8.90

TABLE 4. Summary of the major diagnostic characters, related to scalation, used in distinguishing the 39 species of mabuyine lizards from Caribbean islands (*Marisora brachypoda* is included because it occurs on two islands off Honduras, but it also occurs on the mainland). See individual accounts for additional diagnostic characters specific to each species. Sample sizes as in Table 3, except for total lamellae (sample size in parentheses). N = no; Y = yes; NA = not applicable (or measurement not available).

Species	Midbody scale rows	Dorsals	Ventrals	Dorsals + ventrals	Finger-IV lamellae	Toe-IV lamellae
Alinea berengerae	28	59	65	124	14	19
Alinea lanceolata	30–32	59–61	63–71	122–130	13–15	15–18
Alinea luciae	28–30	54–57	61–69	116–125	14–15	17–20
Alinea pergravis	28–30	62–63	70–73	132–136	15–16	17–20
Capitellum mariagalantae	30	62	63	125	10	14
Capitellum metallicum	30	62	66	128	10	14
Capitellum parvicruzae	30	63	63	126	11	15
Copeoglossum aurae	28–32	50–59	54–65	106–117	12–14	15–18
Copeoglossum margaritae	30–31	53–55	66	119–120	15–16	16–17
Copeoglossum redondae	30	53	59	112	14	15
Mabuya cochonae	32	58–62	70	128–132	12–14	17
Mabuya desiradae	32–34	62	68–70	130–132	13–15	16–18
Mabuya dominicana	27–32	54–63	63–73	118–136	12–16	15–19
Mabuya grandisterrae	30–34	54–61	62–68	116–128	14–15	17–18
Mabuya guadeloupae	32–34	60–63	67–70	128–133	14	18–21
Mabuya hispaniolae	30–32	54–62	67–76	123–138	13–14	16–19
Mabuya mabouya	26–34	55–61	65–75	122–135	13–16	17–19
Mabuya montserratae	32–34	57–63	64–71	123–134	14–15	16–18
Marisora aurulae	30–32	57–63	57–68	114–129	11–15	14–17
Marisora brachypoda	28–30	50–63	57–69	109–129	10–14	13–19
Marisora magnacornae	30	57	60	117	12	17
Marisora roatanae	32	57–58	65–67	122–125	13–15	15–18
Spondylurus anegadae	28–33	58–66	59–70	118–133	10–14	13–17
Spondylurus caicosae	27–32	56–65	56–72	113–134	9–14	13–19
Spondylurus culebrae	30–36	57–65	60–70	121–134	13–16	14–19
Spondylurus fulgidus	28–32	52–58	55–65	108–120	12–16	14–19
Spondylurus haitiae	30–32	59–60	69–72	129–131	12–13	16–17
Spondylurus lineolatus	26–28	57–67	59–67	116–134	8–11	11–16
Spondylurus macleani	32–34	62–65	62–64	125–127	12–14	15–18
Spondylurus magnacruzae	34	60–65	59–70	119–134	12–14	16–18
Spondylurus martinae	32–34	56–65	68–71	124–133	13–17	15–19
Spondylurus monae	28–34	56–65	60–72	119–135	11–16	15–19
Spondylurus monitae	32–34	62–64	64–69	126–132	12–15	16–17
Spondylurus nitidus	28–33	55–63	60–66	117–129	12–15	14–19
Spondylurus powelli	32–34	59–65	62–67	121–132	11–14	14–18
Spondylurus semitaeniatus	31–34	57–65	59–70	119–134	10–15	13–19
Spondylurus sloanii	32–34	59–64	58–68	118–131	10–15	14–18
Spondylurus spilonotus	34	62–64	63–68	125–132	13–15	16–18
Spondylurus turksae	30	59–63	59–63	119–126	12–15	15–17

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TABLE 4. (continued)

Species	Finger-IV + toe-IV lamellae	Total lamellae	Lower preoculars	Prefrontals	Fronto-parietals
Alinea berengerae	33	NA	2	2	2
Alinea lanceolata	28–33	NA	2	2	2
Alinea luciae	31–35	259 (1)	2	2	2
Alinea pergravis	32–36	231–253 (3)	2	2	2
Capitellum mariagalantae	24	169 (1)	3	2	2
Capitellum metallicum	24	167 (1)	2	2	2
Capitellum parvicruzae	26	190 (1)	2(50%, 3(50%)	2	2
Copeoglossum aurae	29–32	216–247 (12)	2(97%), 3(3%)	2	2
Copeoglossum margaritae	32–33	253 (1)	2	2	2
Copeoglossum redondae	29	220 (1)	2	2	2
Mabuya cochonae	29–31	237 (2)	1(50%), 2(50%)	2	2
Mabuya desiradae	29–33	220 (1)	2	2	2
Mabuya dominicana	27–34	211–253 (17)	2(96%), 3(4%)	2	2
Mabuya grandisterrae	31–33	NA	2	2	2
Mabuya guadeloupae	32–35	227–248 (3)	2	2	2
Mabuya hispaniolae	30–33	227–236 (2)	2	2	2
Mabuya mabouya	30–34	216–246 (6)	2	2	2
Mabuya montserratae	30–33	219 (1)	2	2	2
Marisora aurulae	26–32	189–226 (9)	2	2	2
Marisora brachypoda	24–33	206 (1)	2(97%), 3(3%)	1(6%), 2(94%)	2(94%), 3(6%)
Marisora magnacornae	29	210 (1)	2	2	2
Marisora roatanae	28–33	198–227 (2)	2	2	2
Spondylurus anegadae	24–31	206 (1)	2	2(97%), 3(3%)	2
Spondylurus caicosae	22–32	196 (1)	2(98%), 3(2%)	2	2
Spondylurus culebrae	28–34	NA	2	2	2(98%), 3(2%)
Spondylurus fulgidus	27–35	238 (1)	2(96%), 3(4%)	2	2
Spondylurus haitiae	29–30	202 (1)	2	2	1 (50%), 2 (50%)
Spondylurus lineolatus	21–26	159 (1)	2	2	2
Spondylurus macleani	28–31	190–202 (2)	2	2	2
Spondylurus magnacruzae	28–31	205–227 (4)	2	2	2
Spondylurus martinae	28–36	188 (1)	2	2	2
Spondylurus monae	26–33	220 (1)	2(91%), 3(9%)	2	2
Spondylurus monitae	29–32	220 (1)	2	2	2
Spondylurus nitidus	26–33	183–226 (2)	2	2	2
Spondylurus powelli	25–32	186–208 (2)	2	2	2
Spondylurus semitaeniatus	23–33	178–215 (11)	2	2(98%), 4(2%)	2
Spondylurus sloanii	24–30	190–198 (5)	2	2(95%), 4(5%)	2

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TABLE 4. (continued)

Species	Finger-IV + toe-IV lamellae	Total lamellae	Lower preoculars	Prefrontals	Fronto-parietals
Spondylurus spilonotus	29–33	209–230 (5)	2	2	2
Spondylurus turksae	28–30	211 (1)	2	2	2

Species	Supraoculars	Supraciliaries	Supralabial below eye
Alinea berengerae	4	4	6
Alinea lanceolata	4	4(67%), 5(33%)	5(67%), 6(33%)
Alinea luciae	4	4(60%), 5(40%)	5
Alinea pergravis	4	4	5(20%), 6(80%)
Capitellum mariagalantae	4	5	6 (83%), 7 (17%)
Capitellum metallicum	4	5	5
Capitellum parvicruzae	4	6	6(50%), 7(50%)
Copeoglossum aurae	3(3%), 4(97%)	4(3%), 5(66%), 6(31%)	6 (91%), 7 (9%)
Copeoglossum margaritae	4	6	6
Copeoglossum redondae	4	5(50%), 6(50%)	5(50%), 6(50%)
Mabuya cochonae	3	4	5
Mabuya desiradae	3	4	5 (50%), 6 (50%)
Mabuya dominicana	3(60%), 4(40%)	3(2%), 4(86%), 5(11%), 6(2%)	5(70%), 6(28%), 7(2%)
Mabuya grandisterrae	2(20%), 3(80%)	4	5(80%), 6(20%)
Mabuya guadeloupae	3	4	5
Mabuya hispaniolae	3	4(75%), 5(25%)	5(50%), 6(50%)
Mabuya mabouya	3	3(13%), 4(88%)	5(63%), 6(38%)
Mabuya montserratae	3	4	5(63%), 6(38%)
Marisora aurulae	4	4(85%), 5(15%)	5(69%), 6(31%)
Marisora brachypoda	3(6%), 4(94%)	3(3%), 4(89%), 5(6%), 6(3%)	5(89%), 6(11%)
Marisora magnacornae	4	4	5
Marisora roatanae	4	4(67%), 5(33%)	5
Spondylurus anegadae	4	4(95%), 5(5%)	5(76%), 6(24%)
Spondylurus caicosae	3(5%), 4(95%)	3(16%), 4(84%)	4(5%), 5(86%), 6(7%), 7(2%)
Spondylurus culebrae	3(14%), 4(86%)	3(2%), 4(90%), 5(6%), 6(2%)	5(16%), 6(82%), 7(2%)

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TABLE 4. (continued)

Species	Supraoculars	Supraciliaries	Supralabial below eye
Spondylurus fulgidus	4	5	5(25%), 6(67%), 7(8%)
Spondylurus haitiae	4	4	6
Spondylurus lineolatus	4	3(63%), 4(38%)	4(11%), 5(89%)
Spondylurus macleani	4	3(20%), 4(60%), 5(20%)	5(40%), 6(60%)
Spondylurus magnacruzae	4	4	5(11%), 6(89%)
Spondylurus martinae	3(78%), 4(22%)	4	5(56%), 6(44%)
Spondylurus monae	3(3%), 4(97%)	3(3%), 4(91%), 5(6%)	5(9%), 6(91%)
Spondylurus monitae	3(43%), 4(57%)	3(29%), 4(43%), 5(29%)	5
Spondylurus nitidus	3(7%), 4(93%)	4(93%), 5(7%)	5(27%), 6(73%)
Spondylurus powelli	2(6%), 3(13%), 4(81%)	3(6%), 4(94%)	5(31%), 6(69%)
Spondylurus semitaeniatus	3(1%), 4(99%)	3(2%), 4(98%)	5(28%), 6(72%)
Spondylurus sloanii	3(2%), 4(98%)	3(5%), 4(95%)	5(18%), 6(77%), 7(5%)
Spondylurus spilonotus	4	4	6
Spondylurus turksae	4	4(86%), 5(14%)	5(67%), 6(33%)

Species	Supranasal contact	Prefrontal contact	Supraocular-1 / frontal contact	Parietal contact	Nuchal rows
Alinea berengerae	Y	N	N	Y	1
Alinea lanceolata	Y(33%), N(67%)	N	Y(33%), N(67%)	Y	1
Alinea luciae	Y (80%), N (20%)	Y(25%), N(75%)	Y (60%), N (40%)	Y	2(40%), 3(60%)
Alinea pergravis	Y	N	Y(80%), N(20%)	Y	1(80%), 2(20%)
Capitellum mariagalantae	Y (67%), N (33%)	N	N	Y	1
Capitellum metallicum	N	N	N	Y	1
Capitellum parvicruzae	Y	N	N	N	1
Copeoglossum aurae	N	N	Y(16%), N(84%)	Y (3%), N (97%)	1
Copeoglossum margaritae	N	N	N	N	1
Copeoglossum redondae	N	N	N	N	1

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TABLE 4. (continued)

Species	Supranasal contact	Prefrontal contact	Supraocular-1 / frontal contact	Parietal contact	Nuchal rows
Mabuya cochonae	Y	N	Y	Y	1
Mabuya desiradae	Y (50%), N (50%)	N	Y	Y	1
Mabuya dominicana	Y(52%), N(48%)	N	Y(59%), N(41%)	Y	1(98%), 2(2%)
Mabuya grandisterrae	Y(80%), N(20%)	Y(20%), N(80%)	Y	Y	1
Mabuya guadeloupae	N	N	Y	Y	1
Mabuya hispaniolae	N	N	Y	Y	1
Mabuya mabouya	Y(13%), N(88%)	N	Y	Y	1(88%), 2(13%)
Mabuya montserratae	Y(25%), N(75%)	N	Y	Y	1(88%), 2(13%)
Marisora aurulae	Y(46%), N(54%)	N	N	Y	1
Marisora brachypoda	Y(78%), N(22%)	Y(10%), N(90%)	Y(14%), N(86%)	Y(94%), N(6%)	1(97%), 2(3%)
Marisora magnacornae	Y	N	N	Y	1
Marisora roatanae	Y	N	Y(33%), N(67%)	Y	1
Spondylurus anegadae	Y	Y(3%), N(97%)	Y(45%), N(55%)	Y	1(5%), 2(87%), 3(8%)
Spondylurus caicosae	Y(46%), N(54%)	N	Y(38%), N(62%)	Y	1(9%), 2(91%)
Spondylurus culebrae	Y(80%), N(20%)	N	Y(29%), N(71%)	Y(98%), N(2%)	1(4%), 2(88%), 3(8%)
Spondylurus fulgidus	N	Y(52%), N(48%)	Y(48%), N(52%)	Y	2(68%), 3(32%)
Spondylurus haitiae	Y (50%), N (50%)	Y (50%), N (50%)	N	Y	2
Spondylurus lineolatus	Y(44%), N(56%)	Y(11%), N(89%)	Y(11%), N(89%)	Y	1(44%), 2(56%)
Spondylurus macleani	Y(60%), N(40%)	N	Y(20%), N(80%)	Y	1(20%), 2(80%)
Spondylurus magnacruzae	Y(22%), N(78%)	N	N	Y	1(44%), 2(56%)
Spondylurus martinae	Y(11%), N(89%)	Y(11%), N(89%)	Y(67%), N(33%)	Y	1(20%), 2(40%), 3(40%)
Spondylurus monae	Y(60%), N(40%)	N	Y(59%), N(41%)	Y	2(74%), 3(26%)
Spondylurus monitae	N	N	Y(86%), N(14%)	Y	2

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TABLE 4. (continued)

Species	Supranasal contact	Prefrontal contact	Supraocular-1 / frontal contact	Parietal contact	Nuchal rows
Spondylurus nitidus	Y(53%), N(47%)	N	Y(7%), N(93%)	Y	1(7%), 2(80%), 3(13%)
Spondylurus powelli	Y(19%), N(81%)	Y(25%), N(75%)	Y(38%), N(63%)	Y	1(19%), 2(63%), 3(19%)
Spondylurus semitaeniatus	Y(96%), N(4%)	N	Y(35%), N(65%)	Y(98%), N(2%)	1(14%), 2(80%), 3(6%)
Spondylurus sloanii	Y(95%), N(5%)	Y(33%), N (67%)	Y(36%), N(64%)	Y(95%), N(5%)	1(15%), 2(75%), 3(10%)
Spondylurus spilonotus	N	N	Y(17%), N(83%)	Y	2(67%), 3(33%)
Spondylurus turksae	N	N	Y(14%), N(86%)	Y	2(86%), 3(14%)

TABLE 5. Summary of the major diagnostic characters, related to coloration and pattern, used in distinguishing the 39 species of mabuyine lizards from Caribbean islands (*Marisora brachypoda* is included because it occurs on two islands off Honduras, but it also occurs on the mainland). See individual accounts for additional diagnostic characters specific to each species. Sample sizes as in Table 3.

Species	Pale middorsal stripe	Middorsal stripe width (mm)	Middorsal stripe width (% SVL)	Dorsolateral dark stripes	Dorsolateral dark stripe width (mm)
Alinea berengerae	N	NA	NA	N	NA
Alinea lanceolata	N	NA	NA	N	NA
Alinea luciae	N	NA	NA	N	NA
Alinea pergravis	N	NA	NA	N	NA
Capitellum mariagalantae	N	NA	NA	N	NA
Capitellum metallicum	N	NA	NA	N	NA
Capitellum parvicruzae	N	NA	NA	N	NA
Copeoglossum aurae	N	NA	NA	N	NA
Copeoglossum margaritae	N	NA	NA	N	NA
Copeoglossum redondae	N	NA	NA	N	NA
Mabuya cochonae	N	NA	NA	N	NA
Mabuya desiradae	N	NA	NA	N	NA
Mabuya dominicana	N	NA	NA	Y(14%), N(86%)	NA
Mabuya grandisterrae	N	NA	NA	N	NA
Mabuya guadeloupae	Y	NA	NA	Y	NA
Mabuya hispaniolae	N	NA	NA	N	NA
Mabuya mabouya	N	NA	NA	N	NA
Mabuya montserratae	N	NA	NA	N	NA

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TABLE 5. (continued)

Species	Pale middorsal stripe	Middorsal stripe width (mm)	Middorsal stripe width (% SVL)	Dorsolateral dark stripes	Dorsolateral dark stripe width (mm)
Marisora aurulae	N	NA	NA	N	NA
Marisora brachypoda	N	NA	NA	N	NA
Marisora magnacornae	N	NA	NA	N	NA
Marisora roatanae	N	NA	NA	N	NA
Spondylurus anegadae	Y	0.62–1.39	0.95–2.29	Y	1.68–2.39
Spondylurus caicosae	Y	2.00–4.47	3.20–6.69	Y	0.98–1.85
Spondylurus culebrae	Y	1.04–2.03	1.15–3.23	Y	1.80–3.13
Spondylurus fulgidus	Y	2.01–6.09	3.04–10.4	Y	0.60–1.76
Spondylurus haitiae	Y	2.83	3.32	Y	1.81
Spondylurus lineolatus	Y	NA	NA	Y	NA
Spondylurus macleani	Y	2.27–3.04	3.14–3.96	Y	1.52–2.08
Spondylurus magnacruzae	Y	3.29–4.88	3.82–5.39	Y	1.08–1.83
Spondylurus martinae	Y	1.99–2.67	2.76–4.01	Y	1.10–1.70
Spondylurus monae	Y	1.07–1.96	1.41–2.54	Y	1.65–2.77
Spondylurus monitae	Y	1.81–2.51	2.11–2.81	Y	2.09–2.55
Spondylurus nitidus	Y	1.83–4.36	2.61–5.81	Y	0.81–1.89
Spondylurus powelli	Y	1.81–3.80	2.90–5.51	Y	0.88–1.49
Spondylurus semitaeniatus	Y	0.73–1.96	1.11–2.62	Y	1.74–3.21
Spondylurus sloanii	Y	0.76–1.65	1.11–2.42	Y	1.61–2.52
Spondylurus spilonotus	Y	2.80–4.04	3.79–4.63	Y	1.13–1.77
Spondylurus turksae	Y	2.78–3.36	3.51–4.68	Y	0.61–1.73

Species	Dark dorsolateral stripe width (% SVL)	Dark dorsolateral stripe width / middorsal stripe width	Pale dorsolateral stripes	Dark lateral stripe
Alinea berengerae	NA	NA	N	Y
Alinea lanceolata	NA	NA	N	N
Alinea luciae	NA	NA	N	N
Alinea pergravis	NA	NA	N	N
Capitellum mariagalantae	NA	NA	Y	Y
Capitellum metallicum	NA	NA	Y	Y
Capitellum parvicruzae	NA	NA	Y	Y
Copeoglossum aurae	NA	NA	N	Y
Copeoglossum margaritae	NA	NA	N	Y
Copeoglossum redondae	NA	NA	N	Y
Mabuya cochonae	NA	NA	Y	Y
Mabuya desiradae	NA	NA	Y	Y
Mabuya dominicana	NA	NA	Y	Y
Mabuya grandisterrae	NA	NA	N	Y
Mabuya guadeloupae	NA	NA	Y	Y

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TABLE 5. (continued)

Species	Dark dorsolateral stripe width (% SVL)	Dark dorsolateral stripe width / middorsal stripe width	Pale dorsolateral stripes	Dark lateral stripe
Mabuya hispaniolae	NA	NA	Y	Y
Mabuya mabouya	NA	NA	Y	Y
Mabuya montserratae	NA	NA	N	Y
Marisora aurulae	NA	NA	N	Y
Marisora brachypoda	NA	NA	N	Y
Marisora magnacornae	NA	NA	N	Y
Marisora roatanae	NA	NA	N	Y
Spondylurus anegadae	3.00–3.94	1.35–3.79	Y	Y
Spondylurus caicosae	1.46–2.94	0.238-0.805	Y	Y
Spondylurus culebrae	2.33–4.27	0.953–2.24	Y	Y
Spondylurus fulgidus	0.750–2.31	0.115-0.759	Y	Y
Spondylurus haitiae	2.12	0.64	Y	Y
Spondylurus lineolatus	NA	NA	Y	Y
Spondylurus macleani	1.91–3.22	0.608–0.916	Y	Y (faint)
Spondylurus magnacruzae	1.16–2.02	0.276–0.375	Y	Y
Spondylurus martinae	1.86–2.09	0.500–0.742	Y	Y
Spondylurus monae	2.37–3.45	0.985–2.14	Y	Y
Spondylurus monitae	2.24–2.82	0.874–1.27	Y	Y
Spondylurus nitidus	1.24–2.25	0.292–0.619	Y	Y
Spondylurus powelli	1.28–2.71	0.232–0.762	Y	Y
Spondylurus semitaeniatus	2.55–4.64	1.54–3.36	Y	Y
Spondylurus sloanii	2.07–3.97	1.09–2.96	Y	Y
Spondylurus spilonotus	1.21–1.85	0.287–0.464	Y	Y
Spondylurus turksae	0.876–2.18	0.187–0.622	Y	Y

Species	Pale lateral stripe	Dark ventral stripes	Palms & soles
Alinea berengerae	N	N	Pale
Alinea lanceolata	N	Y	Pale
Alinea luciae	N	Y	Dark
Alinea pergravis	N	N	Pale
Capitellum mariagalantae	Y	N	Dark
Capitellum metallicum	N	N	Dark
Capitellum parvicruzae	Y	N	Dark
Copeoglossum aurae	Y	N	Dark
Copeoglossum margaritae	Y	N	Dark
Copeoglossum redondae	Y	N	Dark
Mabuya cochonae	N	N	Dark
Mabuya desiradae	N	N	Dark

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TABLE 5. (continued)

Species	**Pale lateral stripe**	**Dark ventral stripes**	**Palms & soles**
Mabuya dominicana	Y(84%), N(16%)	N	Dark
Mabuya grandisterrae	N	N	Dark
Mabuya guadeloupae	Y	N	Dark
Mabuya hispaniolae	Y	N	Dark
Mabuya mabouya	Y(17%), N(83%)	N	Dark
Mabuya montserratae	Y	N	Dark
Marisora aurulae	Y	N	Dark
Marisora brachypoda	Y	N	Dark (41%), pale (59%)
Marisora magnacornae	Y	N	Pale
Marisora roatanae	Y	N	Dark
Spondylurus anegadae	N	N	Pale
Spondylurus caicosae	Y	N	Dark
Spondylurus culebrae	Y	N	Pale
Spondylurus fulgidus	Y	N	Dark
Spondylurus haitiae	Y	N	Pale
Spondylurus lineolatus	Y	N	Dark
Spondylurus macleani	N	N	Pale
Spondylurus magnacruzae	Y	N	Pale
Spondylurus martinae	Y	N	Pale
Spondylurus monae	Y	N	Pale
Spondylurus monitae	Y	N	Pale
Spondylurus nitidus	Y	N	Pale
Spondylurus powelli	N (or weak)	N	Pale
Spondylurus semitaeniatus	Y	N	Pale
Spondylurus sloanii	N (or weak)	N	Pale
Spondylurus spilonotus	Y	N	Pale
Spondylurus turksae	N	N	Pale

Description of holotype (Figs. 12A, 14). An unsexed adult in excellent state of preservation, without injuries and without an abdominal slit. SVL 59.5 mm; tail length, 28.8 mm (regenerated); HL 11.3 mm; HW 7.07 mm; SW 1.52 mm; EL 0.85 mm; and toe-IV length 7.62 mm; ear-opening medium in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular. Two upper and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 59 in a longitudinal row; ventrals similar to dorsals; 65 in a longitudinal row; 28 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portion of tail, one enlarged row each of middorsal and midventral scales and lateral scale rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 19 under toe-IV. Preanal plate with scales similar to ventrals. Enlarged median subcaudal scales on regenerated portion of tail.

Pattern and coloration. Dorsal ground color medium brown with medium-sized dark brown spots, uniformly distributed on head, body, tail, and limbs. Dark dorsolateral stripes absent, although longitudinal rows of thin (one-half scale) dark stripes faintly evident on dorsum. Dark lateral stripes very faintly present (trace), dark brown, extending from loreal region to midbody. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color in life of the holotype.

Variation. No other specimens are known. Measurements and other morphological data for the holotype are presented in Tables 3–5.

Distribution. This species is known only from the holotype, collected at an imprecise location, between Morgan's Cave and Punta Sur, on San Andrés Island (map not shown). Morgan's Cave is in the middle of the island, and Punta Sur is at the southern tip.

Ecology and conservation. No ecological information is associated with this specimen. But given that its closest relative, *Alinea pergravis*, on Isla de Providencia appears to be arboreal (Dunn & Saxe 1950), and both species have morphological traits associated with scansorial habits (attenuate body, long toes), *A. berengerae* is likely scansorial as well. Unfortunately for a tree-dwelling species, the tropical rainforests of San Andrés that once covered the island are "now almost completely destroyed," being replaced with agriculture (especially coconut palms) and cattle farming (World Wildlife Fund 2007). Heavy use of pesticides and expanding urbanization stemming from tourism are cited as severe threats to the biodiversity. Moreover, brown rats are present on San Andrés in abundance (World Wildlife Fund 2007).

Based on IUCN Redlist criteria (IUCN 2011) we assess the conservation status of *Alinea berengerae* as Critically Endangered (CR A2ace). It faces a primary threat from habitat alteration and a secondary threat from introduced predators. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, if the species still exists. It has not been seen in 44 years and only one specimen is known.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*berengerae*) is a feminine genitive singular noun referring to the first name of the spouse of the describer, Bérengère (Miralles 2006a).

Remarks. In the description of this species, Miralles (2006a) provided a definition of nuchal scales, giving the total nuchal count of *A. berengerae* as 5–6, which if correct would be the highest number in the subfamily. However, we have examined the holotype and score that specimen (Figs. 3G, 12A) as having a single row of nuchals (see Materials and methods for discussion of nuchals counts in Mabuyinae).

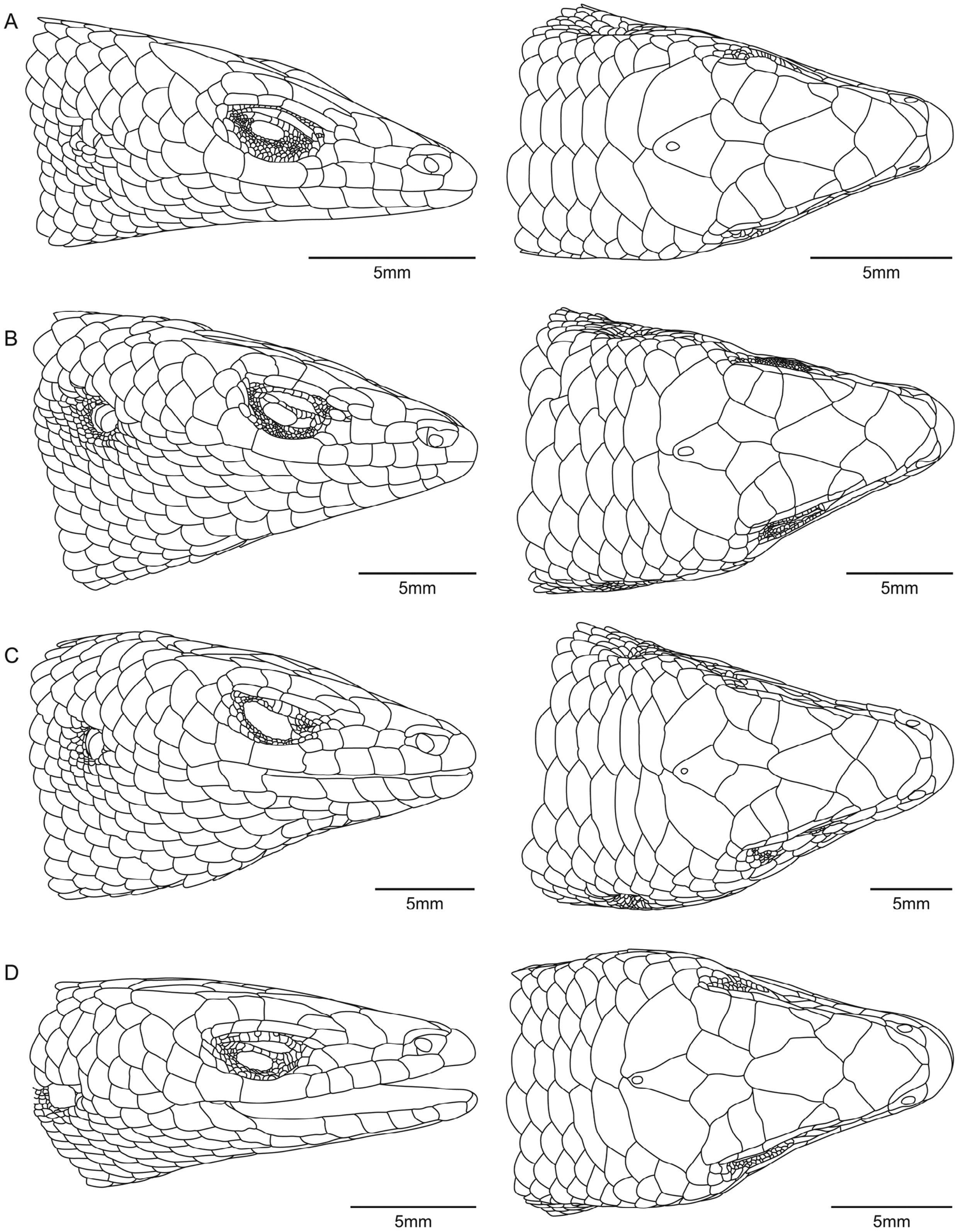

FIGURE 12. Head scalation in species of the Genus *Alinea* (left, side view; right, dorsal view). (A) *A. berengerae* (UMMZ 127884, holotype); (B) *A. lanceolata* (BMNH 89.7.5.13); (C) *A. luciae* (BMNH 89.8.14.20); and (D) *A. pergravis* (MCZ R-14294, paratype).

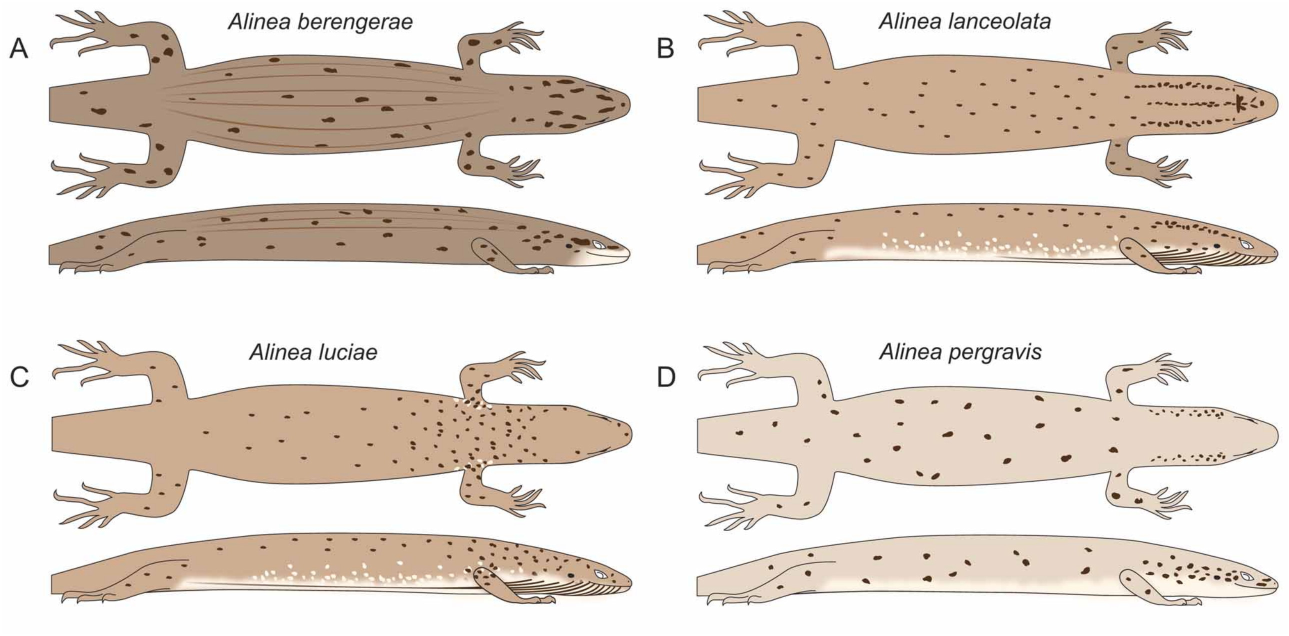

FIGURE 13. Representative patterns in species of the Genus *Alinea* (top, dorsal view; bottom, side view). (A) *A. berengerae*; (B) *A. lanceolata*; (C) *A. luciae*; and (D) *A. pergravis*.

FIGURE 14. *Alinea berengerae*, from San Andrés Island, Colombia. (A–D), UMMZ 172884, holotype, between Morgan's Cave and Punta Sur.

Alinea lanceolata (Cope 1862) comb. nov.

Barbados Skink
(Figs. 12B, 13B, 15)

Mabuia lanceolata Cope, 1862:187. Original syntypes: USNM 6041 (two specimens, recataloged; new lectotype designation: USNM 6041, formerly 6041A; new paralectotype designation**:** USNM 572080, formerly 6041B), collected by Professor Theodore Gill on Barbados.
Mabuya agilis—Boucourt, 1979:395 (part).
Mabuia sloanii—Boulenger, 1887:193 (part).
Mabuia agilis—Fielden, 1889:297 (part).
Mabuya lanceolata—Barbour, 1914:320.
Mabuya mabouia—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya mabouya—Grant, 1959:101 (part).
Mabuya lanceolata—Underwood, 1963:83.
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al*., 1977:40 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part)
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al*., 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:97 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002: 267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Material examined (n = 3). Barbados. USNM 6041 (lectotype), USNM 572080 (paralectotype), both collected by Theodore Nicholas Gill, no specific locality, 1858 (see Remarks); BMNH 89.7.5.13, Colonel H. W. Fielden, Graeme Hall Swamp, ca. 1889 (see Remarks).

Diagnosis. *Alinea lanceolata* is characterized by (1) maximum SVL in males, 82.2 mm; (2) maximum SVL in females, 93.8 mm; (3) snout width, 1.90–2.71% SVL; (4) head length, 16.3–17.8% SVL; (5) head width, 11.2–12.8% SVL; (6) ear length, 1.23–2.24% SVL; (7) toe-IV length, 9.25–10.8% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four (67%), five (33%); (11) frontoparietals, two; (12) supralabial below the eye, five (67%), six (33%); (13) nuchal rows, one; (14) dorsals, 59–61; (15) ventrals, 63–71; (16) dorsals + ventrals, 122–130; (17) midbody scale rows, 30–32; (18) finger-IV lamellae, 13–15; (19) toe-IV lamellae, 15–18; (20) finger-IV + toe-IV lamellae, 28–33; (21) supranasal contact, Y (33%), N (67%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (33%), N (67%); (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, N; (28) pale lateral stripe, N; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Alinea*, *A. lanceolata* is distinguished from *A. berengerae* by having more midbody scale rows (30–32 versus 28), a shorter head (head length 16.3–17.8% SVL versus 19.0% in *A. berengerae*), shorter toes (toe-IV length 9.25–10.8% SVL versus 12.8%), and a non-attenuate body shape (attenuate in *A. berengerae*). It differs from *A. luciae* by having more dorsals (59–61 versus 54–57) and one row of nuchals (2–3 rows in *A. luciae*). From *A. pergravis*, it differs by having fewer dorsals + ventrals (122–130 versus 132–136 in *A. pergravis*), shorter toes (toe-IV 9.25–10.8% SVL versus 11.4–13.2%), and a non-attenuate body shape (attenuate in *A. pergravis*).

Description of lectotype (Fig. 15C–D). An adult male in poor state of preservation, without injuries and with an abdominal slit. SVL 82.2 mm; tail length not measured (broken); HL 13.4 mm; HW 9.24 mm; SW 2.17 mm; EL 1.01 mm; and toe-IV length 7.60 mm; ear-opening small in size and oval; toe length in the following order: I < II < V < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one

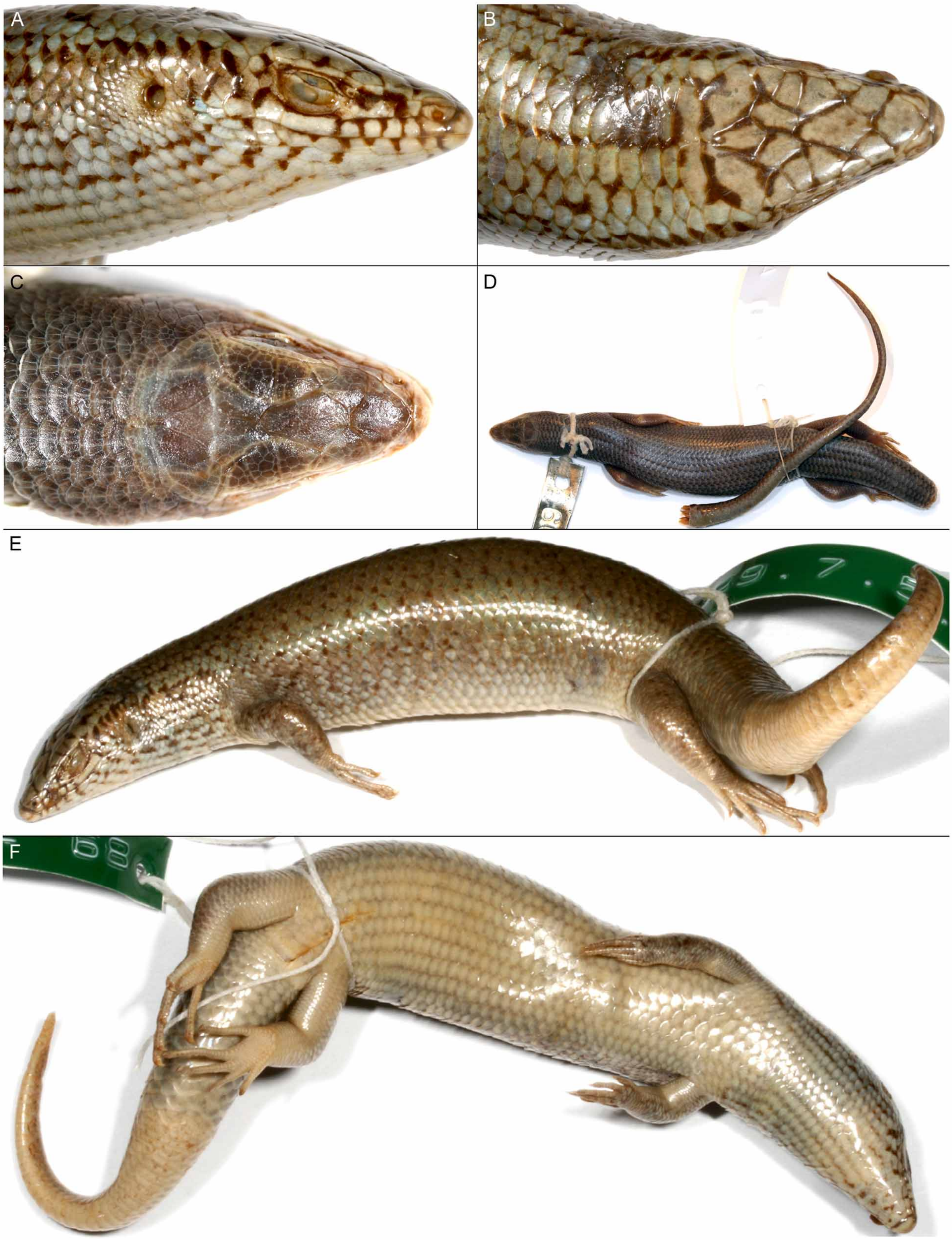

FIGURE 15. *Alinea lanceolata*, from Barbados. (A–B, E–F) BMNH 89.7.5.13, Barbados, Graeme Hall Swamp. (C–D) USNM 6041, lectotype, Barbados (no specific locality).

being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal rectangular and posterior loreal squarish with posteromedial projection on latter. One or two upper and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 59 in a longitudinal row; ventrals similar to dorsals; 71 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 17 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color faded but appears medium brown without visible dark brown spots. Dark dorsolateral stripes, dark lateral stripes, pale middorsal stripe, pale dorsolateral stripes, and pale lateral stripes absent. Ventral surface of body mostly without visible pattern, probably due to poor preservation, but throat (ventral) striping still visible. Palmar and plantar surfaces unpigmented. No information is available on color in life of the lectotype.

Variation. In coloration and scalation, the other material resembled the lectotype (Tables 4–5), in general. The paralectotype, 65.3 mm SVL (a young adult, unsexed) is also in poor condition, but agrees in scalation with the lectotype (except 30 midbody scale rows, 63 ventrals, 13 finger-IV lamellae, and 15 toe-IV lamellae). As with the lectotype, there is virtually no color pattern visible, almost certainly from the poor state of preservation. Nonetheless, the paralectotype shows some evidence of ventral striping, especially along edges of throat. The third and largest specimen, BMNH 89.7.5.13 (Fig. 15A–B and E–F), a 93.8 mm SVL female, is in excellent condition and retains details of coloration. It differs somewhat in scalation from the lectotype (30 midbody scale rows, 61 dorsals, 67 ventrals, 15 finger-IV lamellae, and 18 toe-IV lamellae, five supraciliaries, supralabial six below eye, and supranasals in contact). In coloration (Fig. 15E–F) it has a pale gray-green dorsum with many small brown spots on the body and limbs, sometimes in broken lines, and blue-green pale dorsolateral stripes (as noted elsewhere, the blue-green color of many preserved specimens may be an artifact of preservation).

Distribution. This species is known only from the island of Barbados in the Lesser Antilles (Fig. 11H). The only localities known are Greame Hall Swamp and Chancery Lane (Fielden 1889), about 8 km apart and at the southern tip of the island.

Ecology and conservation. No ecological information is associated with the types. However, the collector of the third specimen writes that it occurs in "damp and rushy situations" (Fielden 1889). He also notes how the mongoose (*Urva auropunctata*), even by the late 1800s, had already severely impacted the endemic reptiles of the island. Barbados is one of the ten most densely populated countries in the World (World Resources Institute 2008) and has essentially no original forest remaining (FAO 2005). Besides the mongoose, black rats (*Rattus rattus* Linnaeus) are on Barbados as well, and are arboreal, and thus the endemic skink would be unable to evade the black rat by climbing trees. Barbour (1937) considered skinks to be extinct on Barbados, as did Underwood (1963), although confirming this would be difficult. Carrington *et al.* (2003), in their book on Barbados heritage, noted only that the skink species that occurs on Barbados and elsewhere is "often found under rocks or old timber and moves with a snake-like slither" (thus not presenting any evidence of its presence or of new records). The two known localities are both nature preserves, but with no sightings of the species since 1889, there is no evidence that they are preserving that species.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Alinea lanceolata* to be Critically Endangered and possibly extinct (CR A2ace). It is known from only three specimens, and there are no records since 1889 despite search efforts by herpetologists, including one of us (S.B.H.). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats.

Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. The adult female, BMNH 89.7.5.13 (93.8 mm SVL), contained seven fetuses, not fully developed. No specific date of collection is available.

Etymology. The species name (*lanceolata*) is a feminine Latin adjective, meaning spear-like, referring to the acuminate head shape, although this feature is a characteristic of the entire genus *Alinea* and even more evident in *A. pergravis*.

Remarks. The collector of the type specimens, Theodore Nicholas Gill (1837–1914), is known to have made only a single expedition to the West Indies (including Barbados), in the first few months of 1858 (Dall 1916). This constrains the date of collection of those specimens, only 4–5 years before their description by Cope (1862a). The third specimen (BMNH 89.7.5.13) was accessioned in 1889, donated by "Col. Fielding." Almost certainly this refers to Col. H. W. Fielden, who wrote an article on the reptiles of Barbados that same year (Fielden 1889). In it he mentioned the collection of specimens, referred to as *Mabuya agilis*, from Graeme Hall Swamp and Chancery Lane. He noted that the local name for it is "scorpion." This provides the only locality information for the species, which has not been recorded since then. More recently, Grant (1959) commented on skinks from Barbados, doubting that they ever occurred on the island. However, we disagree with that opinion and have no doubt that these three specimens came from Barbados, especially given the biographic information on Gill, the account by Fielden, and the specimens that they collected.

Alinea luciae **(Garman 1887) comb. nov.**

Saint Lucia Skink
(Figs. 12C, 13C, 16)

Mabuia luciae Garman, 1887:51. Holotype: MCZ R-6046, collected by Samuel Walton Garman on Saint Lucia in April, 1879.
Mabuya agilis luciae—Boulenger, 1891:353.
Mabuya luciae—Barbour, 1914:322.
Mabuya luciae—Barbour, 1930:105.
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouia—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:40 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).
Mabuya luciae—Miralles *et al.*, 2009:603.

Material examined (n = 5). St. Lucia. MCZ R-6046 (holotype), Samuel Walton Garman, no specific locality, April, 1879; BMNH 89.8.14.20–23, George A. Ramage, no specific locality, 1888–89 (see Remarks).

Diagnosis. *Alinea luciae* is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 109 mm; (3) snout width, 2.90–3.22% SVL; (4) head length, 17.5–18.4% SVL; (5) head width, 12.7–14.1% SVL; (6) ear length, 0.983% SVL; (7) toe-IV length, 11.9% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four (60%), five (40%); (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, two (40%), three (60%); (14) dorsals, 54–57; (15) ventrals, 61–69; (16) dorsals + ventrals, 116–125; (17) midbody scale rows, 28–30; (18) finger-IV lamellae, 14–15; (19) toe-IV lamellae, 17–20; (20) finger-IV + toe-IV lamellae, 31–35; (21) supranasal contact, Y (80%), N (20%); (22) prefrontal contact, Y (25%), N (75%); (23) supraocular-1/frontal contact, Y (60%), N (40%); (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, N; (28) pale lateral stripe, N; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Alinea*, *A. luciae* is distinguished from *A. berengerae* by having fewer dorsals (54–57 versus 59), a wider head (head width 12.7–14.1% SVL versus 11.9%), a wider snout (2.90–3.22% SVL versus 2.55%), shorter toes (toe-IV length 11.9% SVL versus 12.8%), 2–3 rows of nuchals (versus one row), and a non-attenuate body shape (attenuate in *A. berengerae*). *Alinea luciae* differs from *A. lanceolata* by having a wider snout (snout width 2.90–3.22% SVL versus 1.90–2.71%), fewer dorsals (54–57 versus 59–61), and 2–3 rows of nuchals (versus one row). From *A. pergravis*, it differs by having fewer dorsals (54–57 versus 62–63), fewer ventrals (61–69 versus 70–73), fewer dorsals + ventrals (116–125 versus 132–136), and a non-attenuate body shape (attenuate in *A. pergravis*).

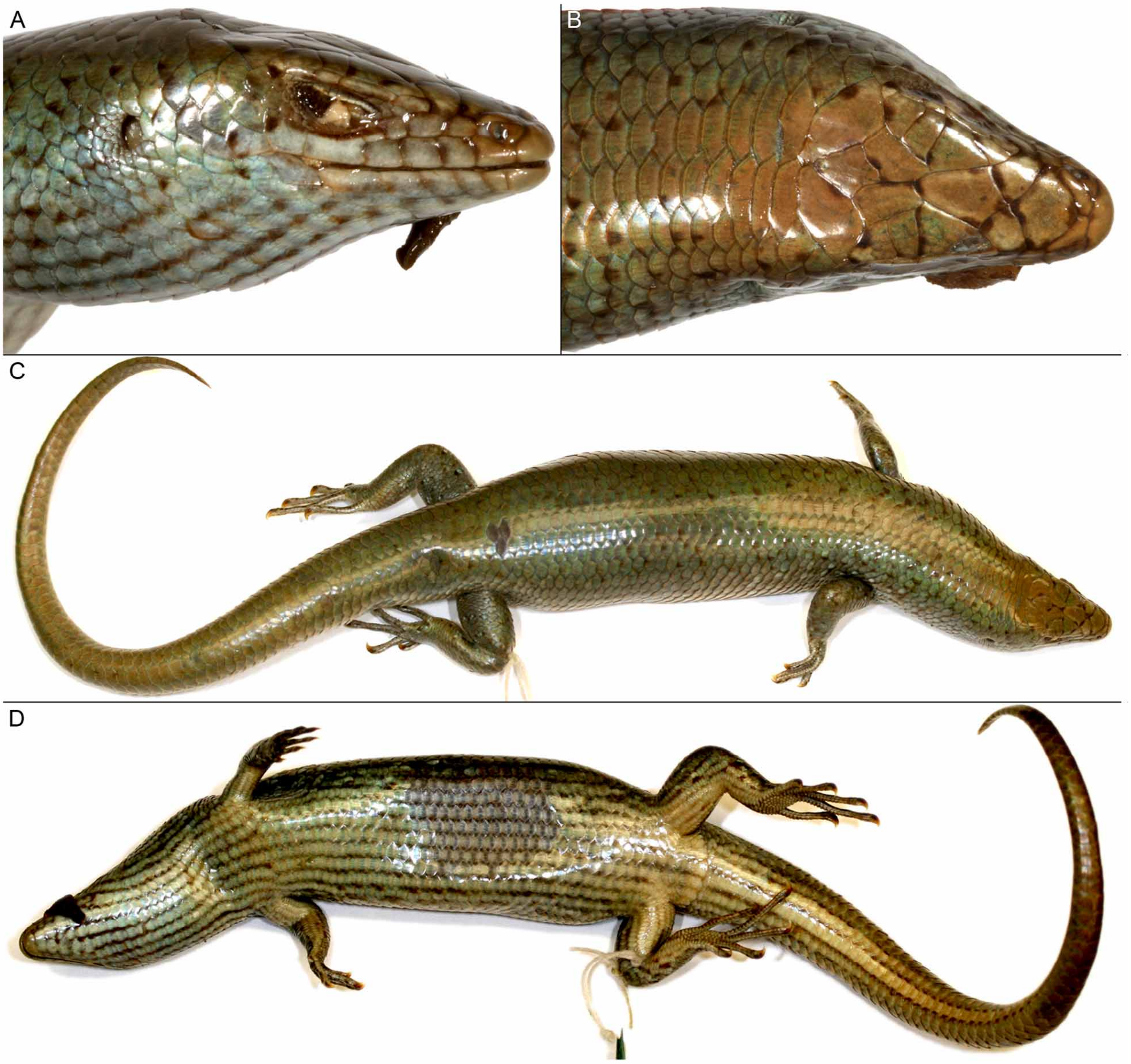

FIGURE 16. *Alinea luciae*, from St. Lucia. (A–D) BMNH 89.8.14.20, St. Lucia (no specific locality)

Description of holotype. An unsexed adult (presumably female based on size) in excellent state of preservation, without injuries and without an abdominal slit. SVL 108.8 mm; tail length 153 mm (complete); HL 19.0 mm; HW 13.8 mm; SW 3.16 mm; EL 1.07 mm; and toe-IV length 12.9 mm; ear-opening small in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first and second supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posterodorsal projection on latter. Three upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye on the right and four on the left comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials on the right and eight on the left. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

Body and limb scalation. Three rows of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 56 in a longitudinal row; ventrals similar to dorsals; 69 in a longitudinal row; 29 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 19 under toe-IV. Six preanals larger than adjacent ventral scales. Enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brown with small dark brown spots, sparsely distributed on head, body, tail, and limbs. Dark dorsolateral stripes, dark lateral stripes, pale middorsal stripe, pale dorsolateral stripes, and pale lateral stripes absent. Ventral surface of body patterned with distinct dark brown stripes extending from the throat to the tail. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

Variation. The four BMNH specimens are similar to the holotype in scalation and pattern (Tables 4–5). One (BMNH 89.8.14.20) has prefrontal contact, which is otherwise rare in Mabuyinae. Another (BMNH 89.8.14.23) lacks supranasal contact. In coloration (Fig. 16A–D) they have a pale brown, tan, or grayish-green dorsum with a scattering of small dark brown spots and occasional white spots. All have the ventral stripes.

Distribution. This species is known only from the island of St. Lucia in the Lesser Antilles (Fig. 11G). No precise localities are known.

Ecology and conservation. No ecological information is associated with the types. Several authors, beginning in 1937, have considered skinks to be extinct on St. Lucia (Barbour 1937; Corke 1987, 1992), and skinks were not encountered in a recent survey of the herpetofauna (Daltry 2009) or in two short visits to the island by one of us (S.B.H.). Confirming the extinction of a small species on a large island like St. Lucia would be difficult. As with many other islands in the Caribbean, the mongoose has been considered to be largely responsible for the decimation of reptile species on St. Lucia, with some qualifications (Corke 1987, 1992). *Alinea* has not been recorded from the Maria Islands off of southeast St. Lucia (Corke 1987; Buley *et al.* 1997), which are mongoose-free.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Alinea luciae* to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*luciae*) is a feminine genitive singular noun, referring to the distribution of the species on St. Lucia.

Remarks. Although Garman himself is listed as the collector of the holotype of *Alinea luciae*, he did not mention an exact locality within the island or ecological notes on the specimen, and nothing is noted in the MCZ database. The four specimens in the BMNH (89.8.14.20–23) have no other data except that they were collected by "G. A. Ramage" and accessioned in 1889. Almost certainly, the collector of those specimens was George A. Ramage (1864–1933), who was employed as a naturalist to collect plants and animals in the Lesser Antilles (1888–89), especially on Dominica and St. Lucia, for the Royal Society and the British Association for the Exploration of the Lesser Antilles (Anonymous 1889; Boulenger 1891). Boulenger (1891) listed those four specimens in his report but made no mention of a specific locality or of ecological information. Barbour (1914) was impressed that Boulenger (1891) recognized Garman's taxon, even as a trinomial, causing him to recognize it as a valid species (*A. luciae*) as well.

Miralles *et al.* (2009) also recognized *Alinea luciae* as valid and listed five characters as diagnostic: dark ventral striping, "white, brown-edged ocelli on the flanks (unique within the genus)", brown marbling on the sides of the neck, four supraoculars, and the presence of one or two secondary nuchal scales. However, those characters are not diagnostic of *A. luciae*. The ventral striping is also present in *A. lanceolata* (Fig. 15) and there are no ocelli (eye spots), but rather scattered white scales. Those white scales and neck marbling are found in *A. lanceolata* and other species, with and without brown edges (e.g., *Copeoglossum aurae* **sp. nov.**). Four supraoculars are known in other populations confused with *Mabuya mabouya* (Dunn 1936), including those on Dominica (here recognized as *M. dominicana*) and Barbados (here recognized as *A. lanceolata*). Multiple nuchals (more than one row) are found in the closely related species *A. pergravis* and occur in the Lesser Antilles (e.g., Dominica, Martinique), albeit uncommonly. Miralles *et al.* (2009) recorded the palms and soles of *A. luciae* as being pale, but they have distinctly dark pigment (Fig. 16).

Alinea pergravis (Barbour 1921) comb. nov.

Providencia Skink
(Figs. 12D, 13D, 17)

Mabuya pergravis Barbour, 1921:85. Holotype: USNM 13875 (not examined), collected by the Albatross Expedition on Isla de Providencia, Department of San Andrés, Colombia, April 1884.
Mabuya pergravis—Dunn, 1936:536.
Mabuya mabouya pergravis—Dunn & Saxe, 1950:154.
Mabuya mabouya pergravis—Peters & Donoso-Barros, 1970:200.
Mabuya mabouya pergravis—Schwartz & Thomas, 1975:141.
Mabuya mabouya pergravis—MacLean *et al.*, 1977:40 (part).
Mabuya mabouya pergravis—Schwartz & Henderson, 1988:150.
Mabuya mabouya pergravis—Schwartz & Henderson, 1991:457.
Mabuya pergravis—Miralles, 2006:1.

Material Examined (n = 6). Isla de Providencia, Colombia. MCZ R-14294 (paratype; no collector, specific locality, or date available); ANSP 25791–95, collected by the Catherwood-Chaplin Expedition, no specific locality, 4 May 1948.

Material not examined (n = 1). Isla de Providencia, Colombia. USNM 13875 (holotype), Albatross Expedition, Isla de Providencia, April, 1884.

Diagnosis. *Alinea pergravis* is characterized by (1) maximum SVL in males, 87.7 mm; (2) maximum SVL in females, 90.9 mm; (3) snout width, 2.65–3.07% SVL; (4) head length, 17.5–19.2% SVL; (5) head width, 10.8–12.8% SVL; (6) ear length, 1.54–1.84% SVL; (7) toe-IV length, 11.4–13.2% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five (20%), six (80%); (13) nuchal rows, one (80%), two (20%); (14) dorsals, 62–63; (15) ventrals, 70–73; (16) dorsals + ventrals, 132–136; (17) midbody scale rows, 28–30; (18) finger-IV lamellae, 15–16; (19) toe-IV lamellae, 17–20; (20) finger-IV + toe-IV lamellae, 32–36; (21) supranasal contact, Y; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (80%), N (20%); (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe N; (28) pale lateral stripe, N; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Alinea*, it is separated from all other species by having a higher number of dorsals (62–63 versus 54–61 in those other species) and combined dorsals and ventrals (dorsals + ventrals 132–136 versus 116–130 in those other species). It also differs from *A. berengerae* and *A. luciae* in having more ventrals (70–73 versus 61–69 in those other species) and by having a larger auricular opening (ear length 1.54–1.84% SVL versus 1.43% SVL in *A. berengerae* and 0.983% SVL in *A. luciae*). From *A. lanceolata* it differs, additionally, by having a longer toe (toe-IV length 11.4–13.2% SVL versus 9.25–10.8% SVL in *A. lanceolata*). *Alinea pergravis* also differs from *A. lanceolata* and *A. luciae* in body shape (attenuate versus expanded at midbody) and ventral coloration (unpatterned versus ventral striping).

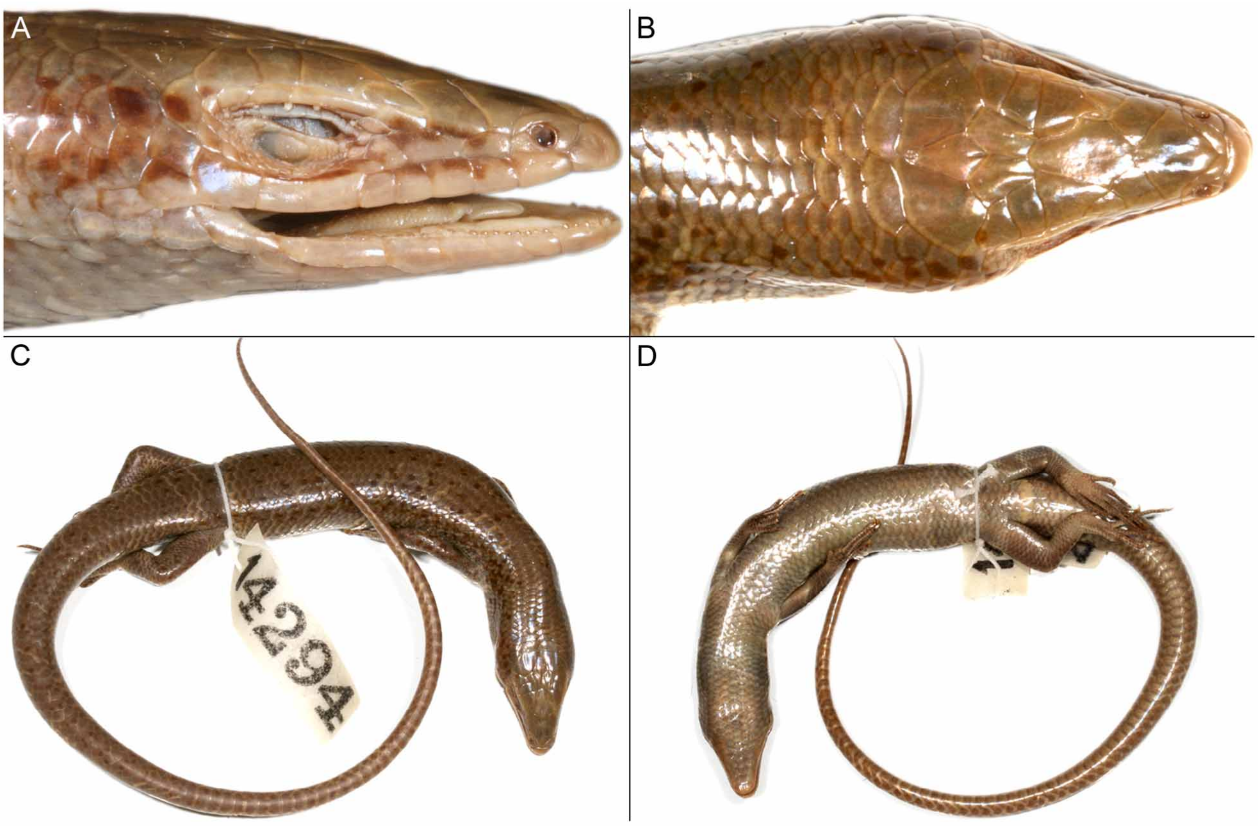

FIGURE 17. *Alinea pergravis*, from Isla de Providencia, Colombia. (A–D) MCZ R-14294, paratype, Isla de Providencia (no specific locality).

Description of material. Five adults (four male and one female) in excellent state of preservation, without injuries and with an abdominal slit. SVL 82.1–90.9 mm; tail length 116–164 mm (complete); HL 15.6–16.7 mm; HW 9.78–10.8 mm; SW 2.25–2.69 mm; EL 1.35–1.61 mm; and toe-IV length 10.4–10.8 mm; ear-openings large and round; toe length in the following order: I < II = V < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long or approximately as wide as long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first (and sometimes second) supraoculars, and frontal. Frontal roughly heptagonal, in contact with the first and/or second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posterodorsal projection on latter. Two or three upper preoculars and two lower preoculars. Seven or eight supralabials, the fifth or sixth being the widest and forming the lower border of the eyelid. Four to six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven or eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two or three pairs of adjoining chin shields in contact with anterior infralabials. First one or two pairs of chin shields in contact medially; second and/or third (and sometimes fourth) pair(s) separated by a smaller cycloid scale.

Body and limb scalation. One to two rows of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62–63 in a longitudinal row; ventrals similar to dorsals; 70–73 in a longitudinal row; 28–30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 15–16 under finger-IV and 17–20 under toe-IV. Preanal scales similar to ventrals. Enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color pale grayish-green with medium-sized dark brown spots, distributed on body, tail, and limbs and on the head of one specimen (ANSP 25791). Dark dorsolateral stripes absent. Dark lateral stripes absent; instead a series of discontinuous brown spots (not a stripe) extend from loreal region to region of forelimbs. Pale middorsal stripe absent, pale dorsolateral stripes, and pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces pale, but with scattered brown flecks on ventral surface of some digits. No information is available on color in life of the holotype.

Distribution. This species is known only from the Caribbean island of Providencia, which lies about 240 km due east of the Nicaraguan coast (Fig. 1). However, there are no specific localities recorded from that island, and therefore no distribution map is shown.

Ecology and conservation. An individual was first spotted on the ground and then went "high into" a tree (Dunn & Saxe 1950). The long toes, high digital lamellae counts, and gracile body shape of this species—the most attenuate species in the Subfamily Mabuyinae—agree with tree-climbing habits. *Spondylurus fulgidus* (Jamaica), another species known to have scansorial habits, comes close to *Alinea pergravis* in these traits (*Mabuya dominicana*, although not known to be scansorial, has long digits and high lamellae counts). Also, the two species of *Psychosaura* gen nov. have similar traits and habits. One can only speculate that it found this open niche on Isla de Providencia after dispersing there from the Lesser Antilles, with selective pressures strongly favoring survival in trees. This species has not been recorded since 1950 (Dunn & Saxe 1950). The tropical rainforests of Isla de Providencia that once covered the island are "now almost completely destroyed", being replaced with agriculture (especially citrus fruits) and cattle farming (World Wildlife Fund 2007). Heavy use of pesticides and expanding urbanization stemming from tourism are cited as severe threats to the biodiversity of the island (World Wildlife Fund 2007).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Alinea pergravis* as Critically Endangered (CR A2ace). It faces a primary threat from habitat alteration and a secondary threat from introduced predators. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, if the species still exists. There have been no records of this species for 60 years.

Reproduction. No data on reproduction are available for this species.

Etymology. Not given in original description (Barbour 1921). However, the species name is from the Latin *per* (very) and *gravis* (heavy), apparently in reference to the larger size of *Alinea pergravis* compared with a species (in the Genus *Lygosoma*) that Barbour considered it to be its close relative. It is not an exceptionally large species of mabuyine skink and is not closely related to *Lygosoma*.

Remarks. The species was described (Barbour 1921) based on four specimens collected in 1884 on the Albatross Expedition to what is now called Isla de Providencia (formerly "Old Providence Island"). The island is only 17 km^2. No diagnosis was given, and no ecological or collecting notes were provided. Later, Dunn (1936) lumped nearly all species of mabuyines known at that time from Caribbean islands into *Mabuya mabouya*, although he recognized *Alinea pergravis* as a distinct species based on its unique, pallid coloration and near absence of stripes. He had available the type series and one other specimen (USNM 78947). Later, Dunn and Saxe (1950) examined five additional specimens collected on the Catherwood-Chaplin expedition of 1948 and discussed variation in all 10 known specimens. Although the new specimens did not differ significantly from the earlier material, Dunn and Saxe (1950) chose to recognize the taxon as a subspecies of *M. mabouya* (*M. mabouya* *pergravis*) rather than a distinct species. They noted similarities with skinks from the southern Lesser Antilles, especially from Barbados (*A. lanceolata*), and pointed out that the winds and current are favorable for dispersal from that region to Providencia. After examining *A. pergravis*, and before reading Dunn and Saxe (1950), we independently came to the same conclusion regarding the affinities of that species and its possible biogeographic origin. Miralles (2006a) examined two specimens of *A. pergravis* and briefly mentioned this species in his description of *A. berengerae*, noting a sample size of 20 individuals in his Table 1. However, that appears to be in error because he referred to Dunn and Saxe (1950), who took counts on the 10 known specimens. As far as we know, no other material of this species has become available. The local name for the species apparently is "Snake-waiting-boy" (Dunn & Saxe 1950).

Genus *Aspronema* gen. nov.

South American White-striped Skinks

Type species. *Mabuia dorsivittata* Cope, 1862:350.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, 1–2, (2) supraciliaries, 3–4, (3) supraoculars, three (rarely four), (4) prefrontal contact, absent (or contact sometimes in *Aspronema dorsivittatum*) (5) parietal contact, present, (6) rows of nuchals, 0–2, (7) dorsals + ventrals, 111–132, (8) total digital lamellae, 185–193, (9) a dark middorsal stripe, present, (10) dark dorsolateral stripes, present, (11) dark lateral stripe, present, and (12) dark ventral striping, absent. Maximum body sizes in this genus are 76–84 mm SVL (Vrcibradic & Rocha 2011) (Table 2).

The combination of three supraoculars and a narrow, dark middorsal stripe distinguishes this genus from all others. Also, while pale dorsolateral and ventrolateral stripes are not rare in Mabuyinae, those stripes in species of the Genus *Aspronema* are especially distinctive.

Content. Two species are placed in this genus: *Aspronema cochabambae* and *A. dorsivittatum* (Table 1).

Distribution. The genus is distributed in southern South America, from Bolivia and southern Brazil to northern Argentina, Paraguay, and Uruguay (Fig. 8C).

Etymology. The generic name (*Aspronema*) is a neuter noun derived from the Greek adjective *aspro* (white) and noun *nema* (thread), referring to the distinctive narrow and white dorsolateral and ventrolateral stripes present in species of this genus.

Remarks. This pair of species shares a suite of morphological traits and clusters in molecular phylogenies (Mausfeld & Lotters 2001; Harvey *et al.* 2008; Miralles *et al.* 2009b), including our analysis (Fig. 5). Palm and sole color is dark in *Aspronema cochabambae* and pale in *A. dorsivittatum* (Harvey *et al.* 2008).

Genus *Brasiliscincus* gen. nov.

Brazilian Small-headed Skinks

Type species. *Scincus agilis* Raddi, 1823:62.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 5–6 (usually five), (3) supraoculars, four, (4) prefrontal contact, absent, (5) parietal contact, present, (6) rows of nuchals, one, (7) dorsals + ventrals, 113–124, (8) total digital lamellae, 157–194, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, usually present (rows of dark dots bordering a light mid-dorsal stripe two half-scales wide), (11) a dark lateral stripe, present, and (12) dark ventral striping, absent (Table 2). Maximum body sizes in this genus range from 88–96 mm SVL (Vrcibradic & Rocha 2011).

Brasiliscincus differs from others in having a combination of dorsolateral dark and pale stripes, small hands and feet, short heads, and pale palms and soles. It differs from *Alinea*, *Copeoglossum*, *Mabuya*, *Notomabuya*, *Psychosaura*, and *Varzea* in having fewer total digital lamellae (< 195). It differs from *Manciola* in having more total lamellae (> 156), fewer dorsals + ventrals (113–124 versus 136–141), and more supraciliaries (5–6 versus four). From *Maracaiba*, *Orosaura*, and *Exila* (dark palms and soles) it differs in having pale palms and soles. From *Exila*, *Notomabuya*, and *Panopa*, it differs in having two frontoparietals (versus one fused frontoparietal in those other genera). In having four supraoculars, *Brasiliscincus* is separated from two genera with three supraoculars:

Aspronema (rarely four) and *Mabuya* (rarely two or four). The presence of a single nuchal row (versus > 1) separates this genus from *Exila*, *Panopa*, and *Spondylurus*. The presence of contact between the parietals separates this genus from *Copeoglossum*. It differs from *Alinea* by having fewer finger-IV + toe-IV lamellae (24–27 versus 28–36), having dark lateral stripes (present as a trace in only one species of *Alinea*, *A. berengerae*), and lacking ventral striping. It is distinguished from *Marisora* by its 5–6 supraciliaries (versus four in nearly all *Marisora*). *Brasiliscincus* shares with *Capitellum* small hands and feet (as reflected in similarly low counts of finger-IV + toe-IV and total lamellae). *Brasiliscincus* differs from *Capitellum* in having pale (versus dark) palms and soles and fewer dorsals + ventrals (113–124 versus 125–128).

Content. Three species are placed in this genus: *Brasiliscincus agilis*, *B. caissara*, and *B. heathi* (Table 1).

Distribution. This genus is distributed in eastern and southern Brazil (Vrcibradic *et al.* 2006) (Fig. 8C).

Etymology. The generic name (*Brasiliscincus*) is a masculine noun derived from the Latin *scincus* (skink) and refers to the distribution of this genus of skinks, centered in Brazil (Portuguese: Brasil).

Remarks. This genus corresponds closely to group "three" defined by Rodrigues (2000), except that we exclude *Manciola guaporicola* and *Aspronema dorsivittatum*. Rodrigues (2000) noted that these species share "vertebral stripes" on the body, although we would describe the dorsal stripes of *Brasiliscincus* more as "dorsolateral" rather than vertebral. Vrcibradic *et al.* (2006) also noted the similar pattern in these three species, describing it as consisting of a dark lateral band bordered below by a vivid white stripe, and a middorsal (pale) stripe with irregular dark borders, but acknowledging that it could be referred to as a pair of irregular dark (dorsolateral) stripes. The molecular phylogeny (Fig. 5) strongly supports the clustering of these three species. This group was found in that earlier study as well (Vrcibradic *et al.* 2006). The paraphyletic nature of clustering in phylogenetic trees of the species of *Brasiliscincus* has led to speculation that they represent a single species (Vrcibradic *et al.* 2006), and recent authors have treated them as such (Miralles & Carranza 2010). It is clear that some sequences obtained in earlier studies have been misidentified (e.g., there are low levels of sequence divergence between sequences labeled as different taxa). However, levels of sequence divergence among some of the sequences (Fig. 5) are greater than among morphologically distinct species of Mabuyinae recognized elsewhere in this classification. It is for this latter reason that we consider the three species to be valid (although in need of revision). Furthermore, those levels of sequence divergence suggest that there may be additional species within *Brasiliscincus*. One character not scored by us was body shape. The species of *Brasiliscincus* have a more tubular body shape than most species of skinks, which are more dorsoventrally flattened. This was noticed by Vrcibradic & Rocha (1996) in their comparison of *B. agilis* and sympatric *Psychosaura macrorhyncha*. The species of *Capitellum* have a similar body shape to those of *Brasiliscincus*, suggesting, along with other character data, a close relationship.

Genus *Capitellum* gen. nov.

Antillean Small-headed Skinks

Type species. *Mabuya metallica* Bocourt, 1879:400.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 5–6, (3) supraoculars, four, (4) prefrontal contact, absent, (5) parietal contact, present (except in *C. parvicruzae* **sp. nov.**), (6) rows of nuchals, one, (7) dorsals + ventrals, 125–128, (8) total digital lamellae, 167–190, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. Maximum body sizes among species in this genus range from 68–78 mm SVL (Table 2). They are small-headed (head length 15–16% SVL; head length in mabuyines is typically 17–21% SVL).

This genus differs from others in having a combination of small hands, small feet, short heads, and lacking dark dorsolateral stripes. It differs from *Alinea*, *Copeoglossum*, *Mabuya*, *Notomabuya*, *Panopa*, *Psychosaura*, and *Varzea* in having fewer total digital lamellae (< 191). It differs from *Manciola* in having more total lamellae (> 166), fewer dorsals + ventrals (125–128 versus 136–141), and five or six (versus four) supraciliaries. From *Exila*, *Notomabuya*, and *Panopa*, it differs in having two frontoparietals (versus one fused frontoparietal in those other genera). In having four supraoculars, *Capitellum* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). The presence of a single nuchal row separates this genus from *Exila*, *Panopa*, and *Spondylurus*. The presence of contact between the parietals (except in *C. parvicruzae* **sp. nov.**)

separates this genus from *Copeoglossum*. It differs from *Alinea* by having fewer finger-IV + toe-IV lamellae (24–26 versus 28–36), having dark lateral stripes (present as a trace in only one species of *Alinea*, *A. berengerae*), and lacking ventral striping. It is distinguished from *Manciola*, *Maracaiba*, and *Marisora* by its 5–6 supraciliaries (versus four in nearly all *Marisora*). It shares with *Brasiliscincus* small hands and feet but differs in lacking dark dorsolateral stripes (present in most *Brasiliscincus*), having dark (versus pale) palms and soles, and having more dorsals + ventrals (125–128 versus 113–124). From *Orosaura*, it is distinguished by lacking a dark dorsolateral stripe. Eyelid window size (length 2.21–2.42% SVL) is also relatively large for the genus, where most other species fall within the range 1.5–2.0% SVL. However, we did not score that character in all individuals and species.

Content. Three species are placed in this genus: *Capitellum mariagalantae* **sp. nov.**, *C. metallicum*, and *C. parvicruzae* **sp. nov.** (Table 1).

Distribution. The genus is distributed on the islands of Martinique and Marie-Galante (Guadeloupe) in the Lesser Antilles and on St. Croix in the U.S. Virgin Islands (Figs. 1, 8A, 10G, and 11B–C).

Etymology. The generic name (*Capitellum*) is a neuter singular noun (Latin) meaning "small head," in reference to the relatively small heads of the three included species.

Remarks. Each species is represented by a single adult specimen collected 135–190 years ago. They occur on islands where the mongoose was introduced in the late 19th century, likely explaining their subsequent disappearance. We have gleaned some critical information on morphology from fetuses and accounts of lost specimens. Molecular data are unavailable. Nonetheless, the shared set of morphological characters argue that they are close relatives and warrant placement in a single group, distinct from other genera. They have a gracile form and unusually small heads, which suggests that they had (or have, if they still exist) terrestrial (ground-dwelling) and possibly cryptozoic (subterranean-dwelling) habits similar to species of *Brasiliscincus* (Vrcibradic & Rocha 2002a). They also have a similar, tubular body shape, as opposed to the dorsoventrally flattened body shape typical of most mabuyines.

Although only one adult specimen exists for each species, there are several clues that suggest that they probably have small maximum body sizes. First, all three adults are relatively small (68–78 mm SVL). Secondly, one of the species (*Capitellum mariagalantae* **sp. nov.**) has developing young. Thirdly, they all have a relatively small number (30) of midbody scale rows, a trait correlated with body size: 71% of species of mabuyines with 30 or fewer midbody scale rows are < 80 mm maximum SVL, whereas 78% of species with 32 or more midbody scale rows are > 80 mm maximum SVL. Although they are scored as being variable in contact between parietals, all three are similar in being at the contact/no contact boundary, with *C. parvicruzae* **sp. nov.** having no contact.

The closest relative to *Capitellum* appears to be *Brasiliscincus* (South America), and therefore an independent overwater dispersal from an ancestor of *Brasiliscincus* probably led to *Capitellum*. The fact that each of the three species occurs on a non-adjacent island could be explained by separate dispersal events from the mainland (least likely), or an initial dispersal to the Lesser Antilles (perhaps Martinique) followed by secondary dispersals to Marie-Galante and St. Croix, or to Marie-Galante and then from there to St. Croix. Because these skinks apparently were decimated by the mongoose before extensive herpetological collections were made in the 20th century, it is possible that the genus was even more widely distributed on Caribbean islands, with one or more extinctions and extirpations occurring before any specimens were collected. Ancient DNA methods may prove useful in addressing the relationships of *Capitellum*.

***Capitellum mariagalantae* sp. nov.**
Marie-Galante Skink
(Figs. 18A, 19A, 20)

M[abuia] aenea—Cope, 1862:186 (part).
Mabuya mabouia—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:39 (part).

Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al*., 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:87 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. ANSP 9413, an adult female from Marie-Galante, Guadeloupe, containing 6 fetuses. Initially in the MNHN but donated to the ANSP at some time prior to 1862. No other collection information is available, but it was possibly collected in the 1830s (see Remarks).

Paratypes (n = 6). Guadeloupe. Fetuses of the holotype, ANSP 9413.

Diagnosis. *Capitellum mariagalantae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 78.3 mm (only known specimen); (3) snout width, 2.55% SVL; (4) head length, 15.8% SVL; (5) head width, 12.3% SVL; (6) ear length, 2.12% SVL; (7) toe-IV length, 9.52% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, five; (11) frontoparietals, five; (12) supralabial below the eye, six (83%), seven (17%); (13) nuchal rows, one; (14) dorsals, 62; (15) ventrals, 63; (16) dorsals + ventrals, 125; (17) midbody scale rows, 30; (18) finger-IV lamellae, 10; (19) toe-IV lamellae, 14; (20) finger-IV + toe-IV lamellae, 24; (21) supranasal contact, Y (67%), N (33%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y (point); (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Capitellum*, *C. mariagalantae* **sp. nov.** differs from *C. metallicum* by having a higher number of supralabial scales (supralabial six or seven below the eye versus supralabial five below the eye in *C. metallicum*), a wider head (head width 12.3% SVL versus 11.5% SVL in *C. metallicum*), and three (versus two) lower preoculars. In pattern (Fig. 19A–B), *C. mariagalantae* **sp. nov.** is a more boldly patterned species than *C. metallicum* (pattern information for *C. metallicum* based on original description and figures because the lectotype has faded). It has pale and dark lateral and dark ventrolateral stripes that extend the full length of the body and onto the tail, whereas *C. metallicum* has only a dark lateral stripe in the anterior one-third of the body. *Capitellum mariagalantae* **sp. nov.** is more similar to *C. parvicruzae* **sp. nov.** in pattern (Fig. 19A, C), although comparison of pattern is difficult because of the poor state of preservation of the holotype of *C. mariagalantae* **sp. nov.** and relies mostly on traces of pattern in the fetuses. It can be seen that the two species share bold lateral dark and pale stripes, both of which run the length of the body and onto the tail. They also have pale dorsolateral stripes anteriorly. Other than these general similarities, it is not possible to make a detailed comparison of patterns in the two species. In scalation *C. mariagalantae* **sp. nov.** differs from *C. parvicruzae* **sp. nov.** in having five supraciliaries (versus six), parietal contact (versus no contact), a larger auricular opening (ear length 2.12% SVL versus 1.44% SVL), and 169 (versus 190) total digital lamellae.

Capitellum mariagalantae **sp. nov.** also differs from species in other genera inhabiting nearby islands in the Lesser Antilles (Tables 3–5). For example, from the species in the same island bank (genus *Mabuya*; see below), *C. mariagalantae* **sp. nov.** differs by having five supraciliaries (not four); four supraoculars (not 2–3); fewer finger-IV (10 versus 12–15), toe-IV (14 versus 16–21), and combined (24 versus 29–35) lamellae; and no supraocular-1/frontal contact (versus contact present in *Mabuya* from Guadeloupe).

Description of holotype (Figs. 18A, 20). An adult female in poor state of preservation, without injuries and with an abdominal slit. SVL 78.3 mm; tail length not measured (broken); HL 12.4 mm; HW 9.66 mm; SW 2.00 mm; EL 1.66 mm; and toe-IV length 7.45 mm; ear-opening large in size and round or slightly oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal and moderately lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, not separated from nuchals by parietals (point contact of parietals); parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Five supraciliaries, approximately equal in length. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Four upper preoculars and three lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Four moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Six infralabials (seven on the left). Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. Both pairs of chin shields separated by smaller cycloid scales.

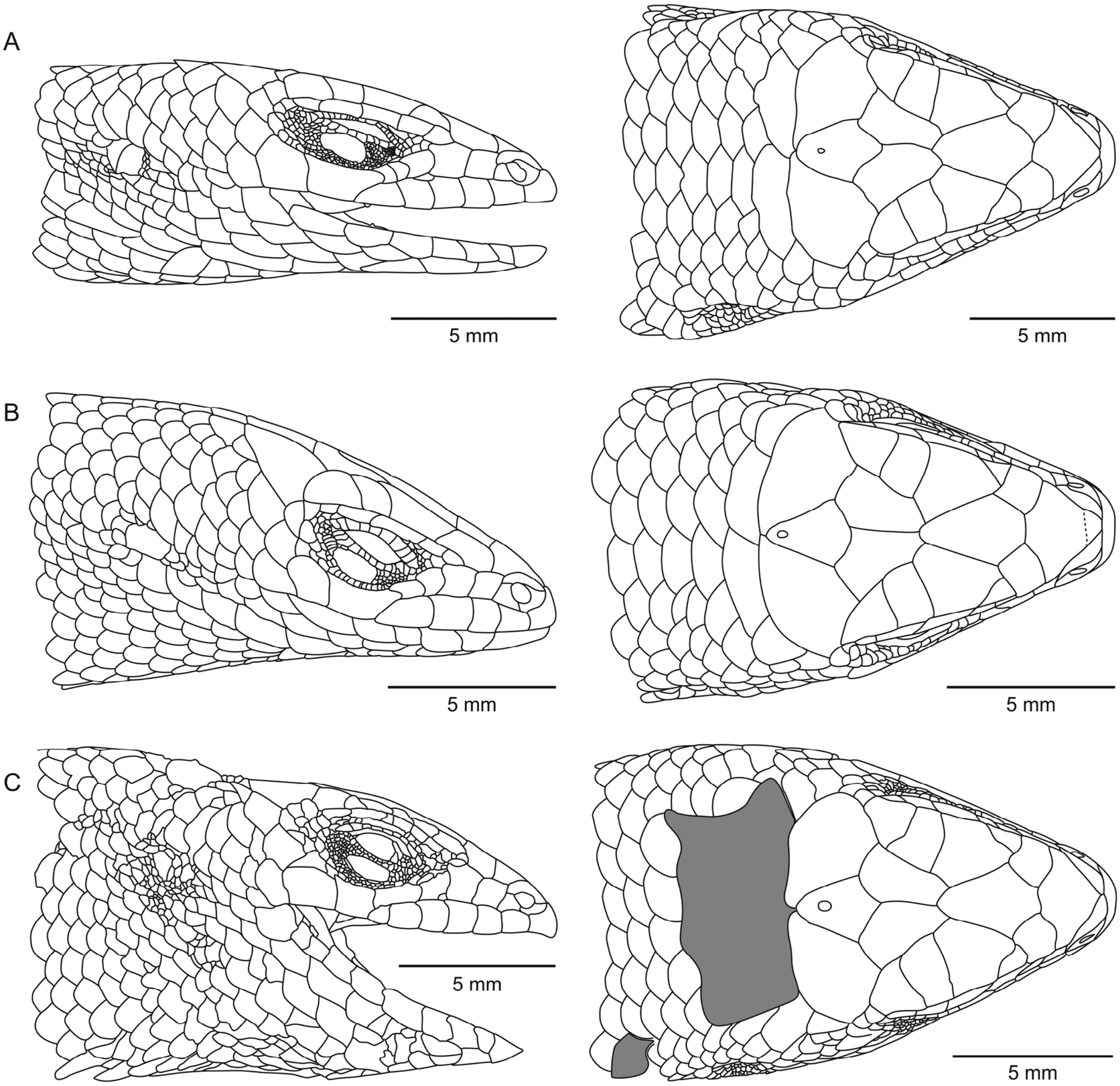

FIGURE 18. Head scalation in species of the Genus *Capitellum* (left, side view; right, dorsal view). (A) *C. mariagalantae* **sp. nov.** (ANSP 9413, holotype); (B) *C. metallicum* (MNHN 5424, lectotype); and (C) *C. parvicruzae* **sp. nov.** (ZMUC-R 99, holotype).

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62 in a longitudinal row; ventrals similar to dorsals; 63 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 10 under finger-IV and 14 under toe-IV, 38 on hands, 47/46 (L/R) on feet, 169 total lamellae. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color dark gray-brown without visible dark brown spots (dorsal pattern has faded). Dark dorsolateral stripes absent. Dark lateral stripes present, medium brown, extending from loreal region past hindlimbs to tail. Pale middorsal stripe absent. Pale dorsolateral stripes present. Pale lateral stripes present, whitish, extending from behind eye to last third of body, bordered below by a narrow (ventrolateral) dark line. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

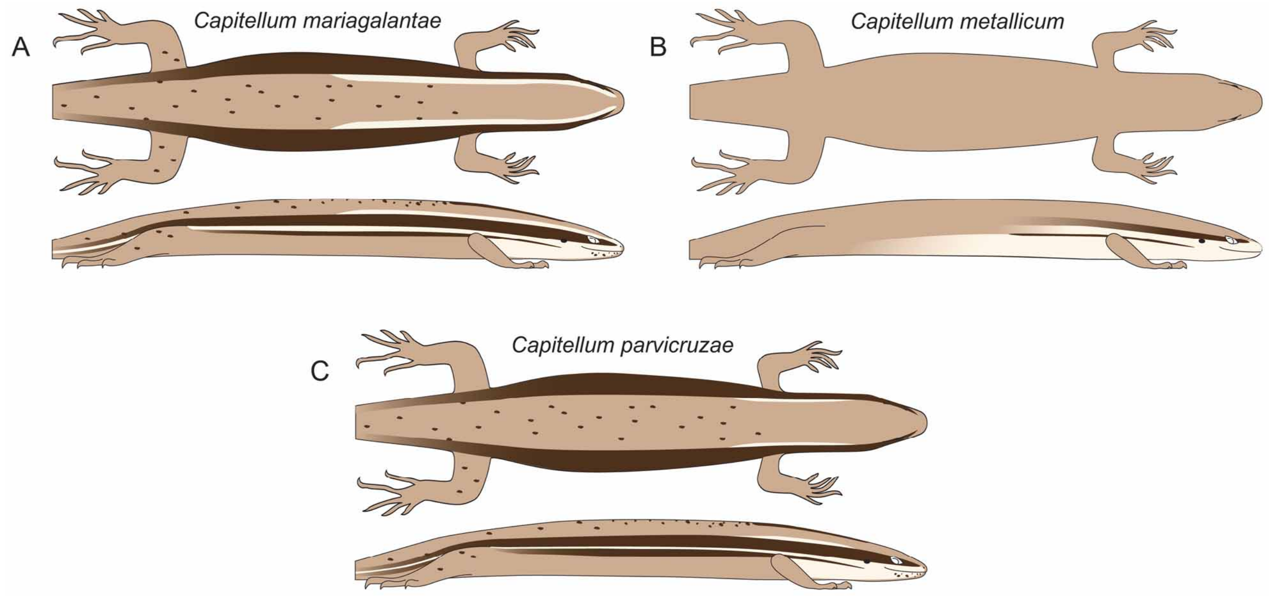

FIGURE 19. Representative patterns in species of the Genus *Capitellum* (top, dorsal view; bottom, side view). (A) *C. mariagalantae* **sp. nov.**; (B) *C. metallicum*; and (C) *C. parvicruzae* **sp. nov.**

Variation. Despite their early stage of development and fragile condition, some information on scalation and pattern of the fetuses could be ascertained (Tables 4–5). They appear to have four supraoculars, five supraciliaries, and no prefrontal contact, as in the holotype. Parietal contact is obvious in one fetus but not scorable in the others. A few could be scored for supralabial scale below the eye, and they showed some variation (scale six or seven below the eye). The lateral pale and dark stripes and the ventrolateral dark lines of the adult are even more evident in the fetuses, probably because they have been obscured from ambient light for two centuries. All extend past the hindlimbs and continue to at least one-third of the length of the tail. The bold lateral pale (white) stripe also forms a ring around the ear opening. Anteriorly, the white lateral stripe extends along the supralabial scales (all pure white) to the nasal. Pale dorsolateral stripes also are evident anteriorly on nape but fade out just past the hindlimbs. Faint traces of dark dorsolateral stripes are evident bordering the pale dorsolateral stripes for a short distance on the nape, but they would have been barely noticeable in life. A pale ventrolateral stripe is faintly visible passing below the forelimbs.

Distribution. The species is distributed on Marie-Galante, Guadeloupe, 158 km^2 (Fig. 11B).

Ecology and conservation. No information is available on the ecology of this species (see Remarks for the genus suggesting that the species were likely terrestrial and cryptozoic). Aside from this single specimen collected at least 150 years ago, there are no other specimens or observations of skinks from this island. The mongoose was introduced to Marie-Galante, and rats undoubtedly are present as well, thus probably explaining the subsequent lack of sightings of skinks. Forest habitats on the island are limited also because of occupation by humans and concomitant manipulation of the environment.

FIGURE 20. *Capitellum mariagalantae* **sp. nov.**, from Marie-Galante, Guadeloupe. (A–C, E–F) ANSP 9413, holotype, Marie-Galante (no specific locality). (D) fetus of ANSP 9413, paratype, Marie-Galante (no specific locality).

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Capitellum mariagalantae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. The female holotype (78.3 mm SVL) contained six fetuses. No specific month of collection is available.

Etymology. The species name (*mariagalantae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Marie-Galante. The island was named for Santa Maria Galanda, the flagship of Christopher Columbus, who discovered the island in 1493.

Remarks. The first mention of the existence of skinks on Marie-Galante was a footnote in a paper by Cope (1862, p. 186), who remarked, "I have supposed a specimen from the Paris Museum labeled as *Eumeces mabuia* from Marie Galante, to belong to *M. aenea*, while new Grenadian and Trinidad specimens have been referred to the cepedii." The low number (9413) of the ANSP specimen and associated notation that it was received in exchange with MNHN confirms that this is the specimen referred to by Cope. The original collector is not known, but

Duméril and Bibron (1839) mentioned two collectors who supplied specimens of skinks from Guadeloupe: Joseph L'Herminier (1802–1866) and M. Beaupertuis. The botanical literature records both being active collectors in the 1830s, just prior to the publication of Duméril and Bibron (1839). Thus it is possible that the Marie-Galante specimen was collected in the 1830s, examined by Duméril and Bibron (1839) for their description of *Eumeces mabouia* (= redescription of *Mabuya mabouya*), and later exchanged with the ANSP prior to 1862. This is supported also by Cope's (1862) mention that the MNHN labeled the specimen as "*Eumeces mabuia*." The MNHN syntype of *S. fulgidus*, a species described by Cope (1862) in the same paper that included his footnote on the Marie-Galante specimen, may have been in exchange for that specimen. Unfortunately the description of *E. mabouia* Duméril and Bibron (1839) does not include sufficient detail on scalation to determine if the Marie-Galante specimen was available to them, and taxonomically it would not matter in any case. Dunn mentioned this specimen in the first sentence of his revision of "American Mabuyas" (Dunn 1936): "the following notes are an attempt to name Mabuyas from the islands of St. Martin, Redonda, and Marie Galante, in the collection of the Academy."

***Capitellum metallicum* (Bocourt 1879) comb. nov.**

Lesser Martinique Skink

(Figs. 18B, 19B, 21)

Mabuya metallica—Bocourt, 1879:400 (new lectotype designation: MNHN 5424, from "Martinique," coll. Auguste Plée, ca. 1820).
Mabuya agilis—Boulenger, 1887:190 (part).
Mabuya mabouia—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:34 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Material examined (n = 1). Martinique. MNHN 5424 (lectotype), an adult female, collected on "Martinique" by Auguste Plée in ca. 1820. The only known surviving specimen of the type series.

Other material (n = 2). Martinique. MNHN (unknown numbers), paralectotypes, one of which was figured by Bocourt (1879, Plate 22B, Fig. 1), both apparently lost.

Diagnosis. *Capitellum metallicum* is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 74.0 mm (only known specimen); (3) snout width, 2.41% SVL; (4) head length, 15.5% SVL; (5) head width, 11.5% SVL; (6) ear length, 1.53% SVL; (7) toe-IV length, 10.6% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, five; (11) frontoparietals, 2; (12) supralabial below the eye, five; (13) nuchal rows, one; (14) dorsals, 62; (15) ventrals, 66; (16) dorsals + ventrals, 128; (17) midbody scale rows, 30; (18) finger-IV lamellae, 10; (19) toe-IV lamellae, 14; (20) finger-IV + toe-IV lamellae, 24; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Capitellum*, *C. metallicum* differs from *C. mariagalantae* **sp. nov.** by having a lower number of supralabial scales (supralabial 5 below the eye versus supralabial 6 or 7 below the eye in *C. mariagalantae* **sp. nov.**), a longer toe (toe-IV 10.6% SVL versus 9.5% SVL in *C. mariagalantae* **sp. nov.**), and a narrower head (head width 11.5% SVL versus 12.3% SVL in *C. mariagalantae* **sp. nov.**). In pattern, *C. metallicum* is a less boldly patterned species than either *C. mariagalantae* **sp. nov.** or *C. parvicruzae* **sp. nov.** (Fig. 19). It has pale and dark lateral, and dark ventrolateral, stripes on the anterior 1/3 of the body whereas those other two species have those stripes that extend the full length of the body and onto the tail. In scalation, *C. metallicum* differs from *C. parvicruzae* **sp. nov.** in having five supraciliaries (versus six), parietal contact (versus no contact), absence of supranasal contact (versus contact), and 167 (versus 190) total digital lamellae.

Capitellum metallicum also differs from species in other genera inhabiting nearby islands in the Lesser Antilles (see Tables 3–5). In form it differs from most in being small-headed and gracile, with a tubular-shaped (versus dorsoventrally flattened) body. From the species on the same island, *Mabuya mabouya*, *C. metallicum* differs by having five supraciliaries (not 3–4); four supraoculars (not three); fewer finger-IV (10 versus 13–16), toe-IV (14 versus 17–19), and combined (24 versus 30–34) lamellae; a shorter head (head length 15.5% SVL versus 16.2–19.2% in *M. mabouya*); a narrower head (head width 11.5% SVL versus 12.1–14.9% SVL in *M. mabouya*); and no supraocular-1/frontal contact (present in *M. mabouya*).

Description of lectotype (Figs. 18B, 21). An adult female in poor state of preservation (soft), without injuries and with an abdominal slit. SVL 74.0 mm; tail length 113 mm (complete); HL 11.5 mm; HW 8.52 mm; SW 1.78 mm; EL 1.13 mm; and toe-IV length 7.85 mm; ear-opening average in size and oval; toe length in the following order: I < V < II < III < IV.

FIGURE 21. *Capitellum metallicum*, from Martinique. (A–F) MNHN 5424, lectotype, “Martinique.”

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal and lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Five supraciliaries, the third the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posterodorsal projection on latter. Three upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye (three on the left) comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin fairly straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by smaller cycloid scales.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62 in a longitudinal row; ventrals similar to dorsals, 66 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 10 under finger-IV and 14 under toe-IV, 38/37 (L/R) on hands, 46/46 on feet, 167 total lamellae. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Pattern and coloration are mostly not determinable because of fading with age and the poor state of preservation of the specimen, which appears uniformly grayish-brown. The loss of pattern is likely from exposure to light during the last two centuries because the concealed areas (palms, and behind arms and legs folded against side of body) show original brown pigment, indicating that the palms and soles were dark and the limbs were finely mottled. No information is available on color in life of the lectotype.

Variation. Bocourt (1879) described three specimens (two now lost) and figured one of them (her Plate 22B, Fig. 1). Based on subtle details of the head scalation (e.g., narrower separation of prefrontals and different overlap of nuchals), her illustrated specimen is clearly not the lectotype but agrees with the lectotype in two diagnostic characters (four supraoculars and five supraciliaries) and in other general characters (separation of supranasals, separation of prefrontals, contact of parietals). In the text description she states that there are 26–28 midbody scale rows (we count 30 in the lectotype); supralabial 5 is below the eye; and one row of nuchals, 55–60 dorsals (we count 62 in lectotype), and four supraoculars (she notes three on one side of one specimen) are present. She also mentions four supraciliaries, but her illustration shows five, and we count five in the lectotype, so the mention of four is unexplained. Also the measurements given of a large (98 mm SVL) unsexed specimen (Bocourt 1879) are consistent with *Mabuya mabouya* in size and head shape, and not with the lectotype, and therefore we have not incorporated those measurements here. In pattern, the species is noted as having "the upper region of the body tinged with sienna metallic greenish reflections." A brown lateral stripe, bordered below by a yellow stripe, is described on the head and anterior of the body, disappearing behind the forearms. The venter is described as having "metallic tones of a greenish yellow." Bocourt's figure shows two dark lateral stripes and a lack of dorsal striping, consistent with that description. *Mabuya mabouya*, also from Martinique, differs only slightly from that description, in having some evidence of pale dorsolateral stripes and dark dorsal flecks. Otherwise Boucourt's description (and figure) of the pattern of *Capitellum metallicum* is similar to that of *M. mabouya*.

Distribution. The species is known only from a single specimen collected at an unknown locality on Martinique (Fig. 11C).

Ecology and conservation. No information is available on the ecology of this species (see Remarks for the genus suggesting that the species were likely terrestrial and cryptozoic). Multiple individuals of two species of ticks are attached in concealed areas behind the left arm. The lectotype was collected nearly two centuries ago, and there are no other existing specimens. The mongoose was introduced to Martinique, and rats are present as well, thus probably explaining the subsequent lack of sightings of skinks. Forest habitats on the island still exist, but there is considerable development and agriculture, limiting available habitat.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Capitellum metallicum* to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands. There are islets of Martinique that do not have mongooses and might sustain populations of this skink.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name is a feminine adjective referring to the coppery, metallic color of the preserved specimens described by Bocourt (1879).

Remarks. Shortly after *Capitellum metallicum* was described, it was synonymized with *Brasiliscincus agilis* (Boulenger 1887) and later with *Mabuya mabouya* (Dunn 1936), where it has remained in synonymy until now. However, this is quite surprising considering how different this species is from *M. mabouya*, the other species on Martinique.

Bocourt (1879) mentioned that she examined three specimens for the description of *Capitellum metallicum*. However, there is no record of any other specimen numbers besides MNHN 5424 (Brygoo 1985), and therefore they appear to be lost. Fortunately she described some aspects of scalation and pattern in those three specimens and figured one of them, which was not the lectotype (see above, Variation). As noted by Bocourt (1879), at least one of the three specimens (and probably all three) was collected by Plée. Auguste Plée (1787–1825) collected in Martinique in ca. 1820 for the MNHN, and his skink material was examined by Duméril and Bibron (1839) and later by Bocourt (1879). Bocourt noted that one of the specimens of *C. metallicum* (the one with three supraoculars on one side) was treated by Duméril and Bibron (1839) as a variety of *Eumeces mabouia* (=redescription of *Mabuya mabouya*). Because *M. mabouya* has four supraciliaries, a similar pattern, and occasionally four supraoculars, it is possible that one of Bocourt's two lost specimens was an *M. mabouya*, something that is impossible to confirm. The small head and small number of digital lamellae, characters that we find to be especially diagnostic, were not considered by Bocourt. We accept Bocourt's description of pattern in this species only because her figure of *C. metallicum* shows an animal with four supraoculars and five supraciliaries on both sides (agreeing with characters of the lectotype), and the illustrated pattern agrees with her description. Otherwise we refrain from accepting other textual information from Bocourt regarding this species because of our concerns that it may pertain to confusion with *M. mabouya*.

Martinique is a large island that is a composite of multiple paleoislands, and other reptiles show geographic variation within Martinique (Breuil 2002; Hedges 2008; Thorpe *et al.* 2010). There is no specific locality for *Capitellum metallicum*, and the only specific localities for *Mabuya mabouya* are on the "North Island" (=northern half of Martinique). Without specific knowledge otherwise, sympatry between the two species on Martinique must be assumed, although *C. metallicum* may have occupied the South Island, allopatric from *M. mabouya* on the North Island. The size difference in the two species, and the apparent terrestrial and cryptozoic habits of *C. metallicum*, would have reduced competition between them in sympatry.

***Capitellum parvicruzae* sp. nov.**

Lesser Saint Croix Skink
(Figs. 18C, 19C, 22)

Holotype. ZMUC-R 99, an adult female from St. Croix (no specific locality), U. S. Virgin Islands, collected by "Mr. Eggers" and accessioned on 10 July 1875.

Diagnosis. *Capitellum parvicruzae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 68.1 mm (only known specimen); (3) snout width, 3.04% SVL; (4) head length, 16.3% SVL; (5) head width, 13.0% SVL; (6) ear length, 1.38% SVL; (7) toe-IV length, 10.4% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, six; (11) frontoparietals, two; (12) supralabial below the eye, 6–7; (13) nuchal rows, one; (14) dorsals, 63; (15) ventrals, 63; (16) dorsals + ventrals, 126; (17) midbody scale rows, 30; (18) finger-IV lamellae, 11; (19) toe-IV lamellae, 15; (20) finger-IV + toe-IV lamellae, 26; (21) supranasal contact, Y;

(22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, N; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Capitellum*, *C. parvicruzae* **sp. nov.** differs from the other two species (*C. mariagalantae* **sp. nov.** and *C. metallicum*) in having six (versus five) supraciliaries, a larger number of total digital lamellae (190 versus 167–169), separation of the parietals (versus contact), a wider snout (3.04% SVL versus 2.41–2.55% SVL), a longer head (16.3% SVL versus 15.5–15.8% SVL), and a wider head (13.0% SVL versus 11.5–12.3% SVL). Comparison of pattern differences is made difficult by the poor condition of the specimens of *C. mariagalantae* **sp. nov.** and *C. metallicum* (pattern information for *C. mariagalantae* **sp. nov.** is based primarily on developing fetuses and that for *C. metallicum* is based on the original description and figures because the lectotype has faded). Nonetheless, *C. parvicruzae* **sp. nov.** also appears to differ in pattern from the other two species in having narrow pale dorsolateral stripes present in the first third of the body, ending just beyond the forelimb insertion (versus wider pale dorsolateral stripes that extend more than two-thirds of body in *C. mariagalantae* **sp. nov.**, and no pale dorsolateral stripes in *C. metallicum*; Fig. 19). Additionally, *C. parvicruzae* **sp. nov.** differs from *C. metallicum* in having a higher number of supralabial scales (supralabial six below the eye versus supralabial five below the eye in *C. metallicum*), and supranasal contact (versus no contact).

Capitellum parvicruzae **sp. nov.** is the only member of the Genus *Capitellum* in the northern Caribbean, including the Bahamas and Greater Antilles. Thus it differs from all other species of skinks in that region, including the Virgin Islands, in generic-level characters. The combination of small hands and feet, a short head, six supraciliaries, a single row of nuchals, and absence of dark dorsolateral stripes will distinguish it from other skinks in the region.

Description of holotype (Figs. 18C, 22). An adult female in moderate state of preservation, with an injury in the nuchal area and with an abdominal slit. SVL 68.1 mm; tail length 26.7 mm (broken); HL 11.1 mm; HW 8.83 mm; SW 2.07 mm; EL 0.94 mm; and toe-IV length 7.09 mm; ear-opening large in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal roughly diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first and second supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, not separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Six supraciliaries, the third the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posterodorsal projection on latter. Two or three upper preoculars and two (right) or three (left) lower preoculars. Eight (left) or nine (right) supralabials, the sixth (left) or seventh (right) being the widest and forming the lower border of the eyelid. Six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin curved slightly away from tip of snout. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by smaller cycloid scales.

Body and limb scalation. One paired row of nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 63 in a longitudinal row; ventrals similar to dorsals; 63 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 11 under finger-IV and 15 under toe-IV, 41/42 (L/R) on hands, 54/53 (L/R) on feet, 190 total lamellae. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brownish-green with scattered dark brown spots. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region past hindlimbs and onto tail. Middorsal zone (pale stripe absent) brownish-green. Pale dorsolateral stripes present, white, extending from nuchal area to first third of body, with dark brown edges (0.55–0.86 mm), too thin and irregular to constitute dark dorsolateral stripes. Pale lateral stripes present, whitish, extending from below eye onto tail, bordered below by a narrow (ventrolateral) dark line. Ventral surface of body without pattern. Palmar and plantar surfaces medium brown. No information is available on color in life of the holotype.

FIGURE 22. *Capitellum parvicruzae* **sp. nov.**, from St. Croix. (A–F) ZMUC-R 99, holotype, St. Croix (no specific locality).

Variation. No other specimens are known. Measurements and other morphological data for the holotype are presented in Tables 3–5.

Distribution. The species is distributed on St. Croix, U.S. Virgin Islands, 230 km^2 (Fig. 10G).

Ecology and conservation. No information is available on the ecology of this species (see Remarks for the genus suggesting that the species were likely terrestrial and cryptozoic). Aside from this single specimen collected at least 135 years ago, there are no other specimens or observations of the species. The mongoose was introduced to St. Croix at about that time, thus probably explaining the subsequent lack of records. It co-occurred with the large species *Spondylurus magnacruzae* **sp. nov.** (107 mm, maximum SVL) on St. Croix, but that species, too, has not been seen since the late 19th century. Forest habitats on St. Croix are limited because of occupation by humans and concomitant manipulation of the environment.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Capitellum parvicruzae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. No data on reproduction are available for this species.

Etymology. The Latin species name (*parvicruzae*) is a feminine genitive singular noun referring to the smaller size of this species (*parvus*, small) compared with the other species on St. Croix, *Spondylurus magnacruzae* **sp. nov.**, and to its distribution. The island was named "Santa Cruz" by Christopher Columbus in 1493 and later renamed Saint Croix by the French.

Remarks. This specimen was accessioned in the ZMUC collection after the publication of Reinhardt and Lütken (1863) and thus it was not mentioned in that treatment. We have not found evidence that it has been examined previously for taxonomic reviews of mabuyine skinks, or listed in another publication, which is why we show no synonymy. Unlike the 19th century ZMH material from "St. Thomas," some of which appears to have come from other locations (see Remarks under *Marisora aurulae* **sp. nov.** and *Spondylurus fulgidus*), we are more confident with locality information associated with the ZMUC material (14 specimens) from St. Thomas, St. John, and St. Croix. Except for this one specimen, the species represented are all known from the Virgin Islands (based on material in other collections).

We immediately noticed that ZMUC-R 99 was a representative of the Genus *Capitellum*, otherwise known from two very poorly preserved specimens from Marie-Galante and Martinique, 180–190 years old. In contrast, this specimen is well-preserved, including its color pattern. Details of the pattern agreed with *C. mariagalantae* **sp. nov.** (the pattern on *C. metallicum* is no longer visible but was figured and described in the original description, before it had faded) to further convince us that it was a *Capitellum*. The closest mainland species that it might be confused with are in the Genus *Brasiliscincus*. However, ZMUC-R 99 lacks the middorsal striping of species in that genus and has a higher number of dorsals + ventrals and a smaller ear. Despite being allied with *Capitellum*, it was sufficiently different in scalation from *C. mariagalantae* **sp. nov.** and *C. metallicum* to warrant recognition as a separate species, endemic to St. Croix.

The holotype of *Capitellum parvicruzae* **sp. nov.** was collected in 1875, together with a specimen of *Spondylurus magnacruzae* **sp. nov.** (the other species on St. Croix), by "Mr. Eggers." This almost certainly refers to Henrik Franz Alexander von Eggers, a Danish army captain and naturalist of St. Croix who published a Flora of the island at about that time (Eggers 1879). Unfortunately there are no other collection data associated with the holotype, and no other specimens are known. Besides having a broken tail, it has a large injury behind the head. A puncture wound on the throat, immediately below the dorsal wound, suggests that a knife was used to kill the lizard from above, with the point of the blade exiting the throat.

Genus *Copeoglossum* Tschudi, 1845
Neotropical Spotted Skinks

Copeoglossum Tschudi, 1845:162. Type species: *Copeoglossum cinctum* Tschudi, 1845:162, by monotypy; = *Mabuya nigropunctata* (Spix 1825); synonymy by Avila-Pires, 1995:584.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 3–6 (usually 5–6), (3) supraoculars, four (rarely three), (4) prefrontal contact, absent (or contact rarely), (5) parietal contact, absent (or contact rarely), (6) rows of nuchals, one (occasionally no rows), (7) dorsals + ventrals, 105–120, (8) total lamellae, 196–253, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent (chin spotting in *Copeoglossum margaritae* **sp. nov.**). They are large, with a range of maximum body sizes among the species of 91–121 mm SVL (Table 2).

The combination of the above characters, but especially the separation of the parietal scales (in almost all individuals) and low dorsal + ventral counts, distinguishes this genus from all other genera. In most (excluding *Copeoglossum redondae* **sp. nov.**), the sublabials extend all the way forward to the fused postmental (or nearly so), and this is another useful character, although not unique in the genus (e.g., it occurs in *Notomabuya frenata*). The dark lateral stripe of species in this genus usually extends all the way back to the hindlimbs (or further), and the dorsum, which lacks dark dorsolateral stripes and a pale middorsal stripe, is usually covered with scattered dark spots, but coloration and pattern are variable.

Content. Five species are placed in the genus: *Copeoglossum arajara*, *C. aurae* **sp. nov.**, *C. margaritae* **sp. nov.**, *C. nigropunctatum*, and *C. redondae* **sp. nov.** (Table 1).

Distribution. The genus is distributed throughout much of the Amazon basin and other regions of central, northern, and eastern South America, including Brazil, Bolivia, Colombia, Ecuador, Peru, Venezuela (including Isla de Margarita), Guyana, French Guiana, and Suriname. It also occurs in the Lesser Antilles (Redonda, St. Vincent, the Grenadines, and Grenada), Trinidad, and Tobago (Figs. 1, 8C, 9D, and 11D–E, I–J).

Etymology. The generic name (*Copeoglossum*) is a neuter noun, derived from the Greek nouns *kopeus* (chisel) and *glossa* (tongue), in allusion to the shape of the tongue.

Remarks. Avila-Pires (Avila-Pires 1995) redefined *Copeoglossum nigropunctatum* and designated a neotype from Brazil. Since then, the species has been shown to be distributed even more widely (Miralles *et al.* 2005a; Miralles & Carranza 2010). However, molecular phylogenetic evidence here (Fig. 5), and evidence presented previously with most of the same sequences (Whiting *et al.* 2006; Miralles and Carranza 2010), has revealed that the species is comprised of genetically diverse populations with long branch lengths, indicating the presence of unnamed species. Miralles and Carranza (2010) did not make a revision of *C. nigropunctatum*, and did not diagnose taxa, but instead suggested that three clades could be recognized within what is currently *C. nigropunctatum*, and gave them geographic names: (1) the "Occidental Clade," a northern (including Caribbean islands) and western group that presumably encompasses the type-locality of *C. nigropunctatum*, (2) the "Oriental Clade," extending from the Atlantic to western and southern Brazil, and (3) the "Meridional Clade," distributed in southern Brazil. Miralles and Carranza (2010) further suggested the three clades represent three species, recommending that the name *Euprepis surinamensis* Hallowell (1857) be used for the Oriental Clade. However, the holotype of that species is missing and presumed lost (Dunn 1936), a serious problem for allocating the name to one of several overlapping clades (within the Oriental Clade) in northeast South America (see below). Also, *Tiliqua aenea* Gray (1831a) is an earlier available name for a South American (not Antillean) skink species within the Genus *Copeoglossum* (see discussion below, in Remarks for *C. aurae* **sp. nov.**). No molecular data are yet available for *Mabuya arajara*, but Miralles and Carranza (2011) suggested that it belongs to the Oriental Clade. Therefore, the Genus *Copeoglossum* as recognized here is synonymous with the "*Mabuya nigropunctata* species complex" of Miralles and Carranza (2011).

Our interpretation of the number and distribution of unnamed species in *Copeoglossum* differs from that of Miralles and Carranza (2010). We examined museum material of this genus, from the Occidental and Oriental clades (Appendix 2) and Caribbean islands, and diagnose three new species from Caribbean islands. DNA sequences are not available for two of those (*C. margaritae* **sp. nov.** and *C. redondae* **sp. nov.**) but sequences from the other species (*C. aurae* **sp. nov.**) indicate that it belongs to the Occidental Clade and differs from *C. nigropunctatum* sequences in that clade (samples 1–2, 5–9, 31; presumably *C. nigropunctatum* sensu stricto) by 5% sequence divergence (cyt b) and from a Venezuelan sample (sample 41) by 2.6% (Fig. 6). In terms of degree of morphological and molecular divergence, this is consistent with our results for species differences in other genera of mabuyine skinks (Figs. 5–7), and therefore, in contrast to Miralles and Carranza (2010), we conclude that each of these three clades of *Copeoglossum* contain multiple species, instead of a single species.

Until a revision is made of the South American material of *Copeoglossum*, beyond the scope of this study, it is not possible to assign available names or new names to clades in that region. The three clades defined by Miralles and Carranza (2010) overlap broadly, in contrast to their geographic names. Based on the distribution of localities within each clade, their relationships, and levels of sequence divergence, we propose that *Copeoglossum* contains at least 14 species, including the three diagnosed here from Caribbean islands. We have not used a strict sequence divergence cutoff to diagnose species. Instead, we note that our putative species show a geographic cohesiveness below about 1–2% (cyt b) divergence and lose that cohesiveness above about 2–3% divergence. This is consistent with skink species on Caribbean islands where we find that several morphologically diagnosable species differ by only 1.5% sequence divergence, and sympatric species (e.g., *S. semitaeniatus* and *S. sloanii*) differ by as little as 2.7% divergence (Fig. 6). The sparse molecular sampling of *C. nigropunctatum* suggests that even more species will be identified in the future as additional populations are sampled.

Concerning the Occidental Clade, there are at least five species. We agree with Miralles and Carranza (2010) that the name *Copeoglossum nigropunctatum* probably goes with this clade, and most likely with samples 5–9 in our analysis. Those samples are from the state of Amazonas, Brazil, which contains the type-locality. We also include samples 1–2 (Porto Walter, Acre, Brazil) and sample 31 (Puerto Inirida, Guainia, Colombia) in this putative Species A. It is uncertain whether all of these samples represent the same species, yet they have a relatively small amount of sequence divergence (< 2%) considering their great geographic separation (up to ~1500 km). Species B, an unnamed species, is represented in the tree by sample 41, from north-central Venezuela (Turiamo, Aragua). It is the closest relative of *C. aurae* **sp. nov.** (Figs. 5–7). We examined museum material from that region and elsewhere in Venezuela (Appendix 2) as part of our diagnosis of the three Caribbean species. We tentatively treat the other two Caribbean island species, *C. margaritae* **sp. nov.** and *C. redondae* **sp. nov.**, as members of the Occidental clade, based largely on geography, but their relationships within the Genus *Copeoglossum* are not known. Atlantic ocean currents (Hedges 1996b) also may have brought the ancestor of *C. redondae* **sp. nov.** from eastern South America (Oriental Clade).

Within the Meridional Clade, we have identified three putative species (C–E). Species C is from the western Brazilian Highlands (samples 23–24, and 26; all from Rondônia, Brazil). As noted by Miralles and Carranza (2010), there is sympatry at that locality with another putative species (our Species I, of the Oriental Clade). We tentatively include sample 10 (Brasilía, Brazil) in this species, from ~2000 km to the east. It shows a relatively small amount of divergence (~2%) from the Rondônia samples of Species C in Fig. 6, but it is missing a sequence from the fast-evolving cyt b gene, which would otherwise increase that overall divergence. Species D is represented by sample 15 (Aripuanã, Mato Grosso, Brazil). As noted by Miralles and Carranza (2010), there is sympatry at that locality with another putative species (again, our Species I, of the Oriental Clade). Species E includes Brazilian samples 13 (Niquelandia, Goias) and 16 (UHE Manso, Mato Grosso) with relatively small sequence divergence (1.4%; Fig. 6) between them despite a large geographic separation (~800 km). The cyt b sequence divergence among species C–E is as high as 8% (Fig. 6).

Within the Oriental Clade, we have identified five putative species, each geographically distinct and with several occurring broadly and narrowly in sympatry in the Guiana Highlands, and separated from each other by 3.0–8.5% (Fig. 6). Species F is from the Brazilian Highlands (sample 21; Piaui, Brazil). Species G is broadly distributed and occurs in the central (samples 27–30; Mount Roraima) and eastern (samples 17–20, 32, and 39; southern Guyana, and Pic Coudreau, French Guiana) Guiana Highlands southward and eastward to the Amazon delta area (samples 27–30; three locations in Pará, Brazil) and over to the northeast Brazilian Highlands (samples 11–12; Ceara, Brazil). Species H is from the Guiana Highlands (samples 35–38, 40, and 42; St. Eugène and Pic Coudreau). Species I is from the western Brazilian Highlands (samples 14, 22, and 25; Mato Grosso Plateau). Species J is also from the Guiana Highlands (samples 3–4, and 33–34; Mitaraka, French Guiana and Amapá, Brazil). Two species (G and H) are sympatric at Pic Coudreau, French Guiana (samples 39–40). These two putative species are not each other's closest relatives, and have a sequence divergence (cyt b) of 4.7 % (Fig. 6).

In summary, we suggest here that the *Copeoglossum* contains at least 14 species, three of which are diagnosed and named below. That interpretation is consistent with morphological and genetic divergence in mabuyine skinks of Caribbean islands. Instead of applying a strict genetic divergence cutoff to arrive at that conclusion, we use phylogenetic pattern, geography, sympatry, and sequence divergence. There were insufficient samples to perform an ABGD analysis (Puillandre *et al.* 2011). However, this may be a useful tool for species delimitation in mabuyines in the future, as more samples and DNA sequences become available. Until a revision is made of South American members of *Copeoglossum*, we recommend continued use of the name *C. nigropunctatum* for the unnamed putative species discussed above.

***Copeoglossum aurae* sp. nov.**
Greater Windward Skink
(Figs. 23A, 24A, 25)

Mabuia agilis—Boulenger, 1887:191 (part).
Mabuia aenea—Garman, 1887:53 (part).
Mabuya aenea—Barbour, 1914:322 (part).
Mabuya aenea—Barbour, 1930:105 (part).

Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya aenea—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:40–41 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Murphy, 1997:150 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Miralles, 2005:49 (part?).
Mabuya nigropunctata—Miralles *et al.*, 2005:833 (part).
Mabuya nigropunctata—Miralles *et al.*, 2009:609 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

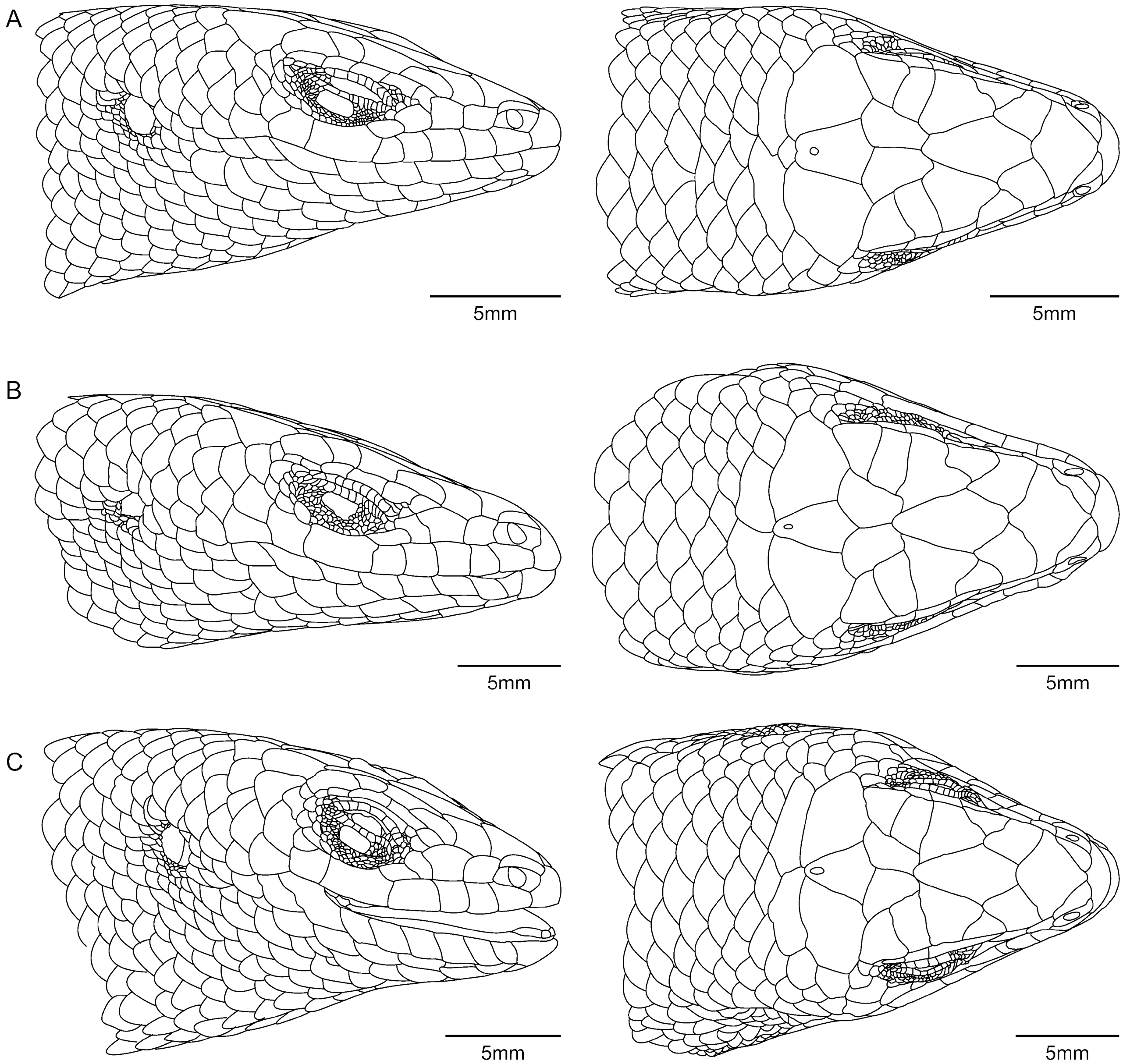

FIGURE 23. Head scalation in species of the Genus *Copeoglossum* occupying Caribbean islands (left, side view; right, dorsal view). (A) *C. aurae* **sp. nov.** (BMNH 90.11.25.16, paratype); (B) *C. margaritae* **sp. nov.** (USNM 217141, holotype); and (C) *C. redondae* **sp. nov.** (ANSP 9517, holotype).

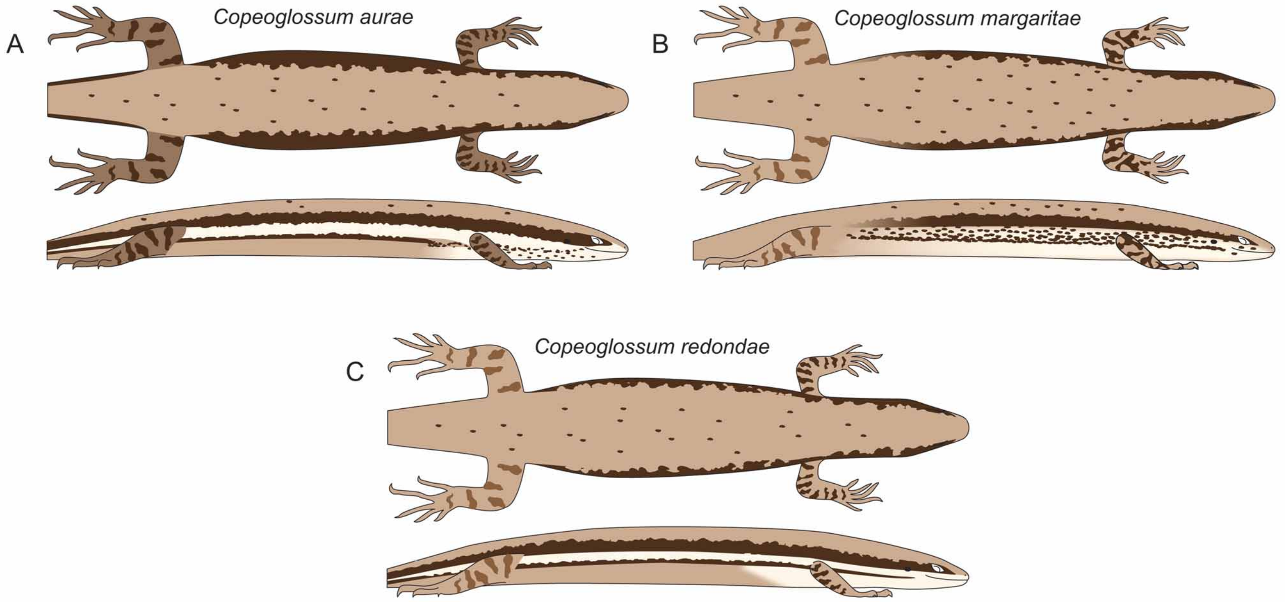

FIGURE 24. Representative patterns in species of the Genus *Copeoglossum* occupying Caribbean islands (top, dorsal view; bottom, side view). (A) *C. aurae* **sp. nov.**; (B) *C. margaritae* **sp. nov.**; and (C) *C. redondae* **sp. nov.**

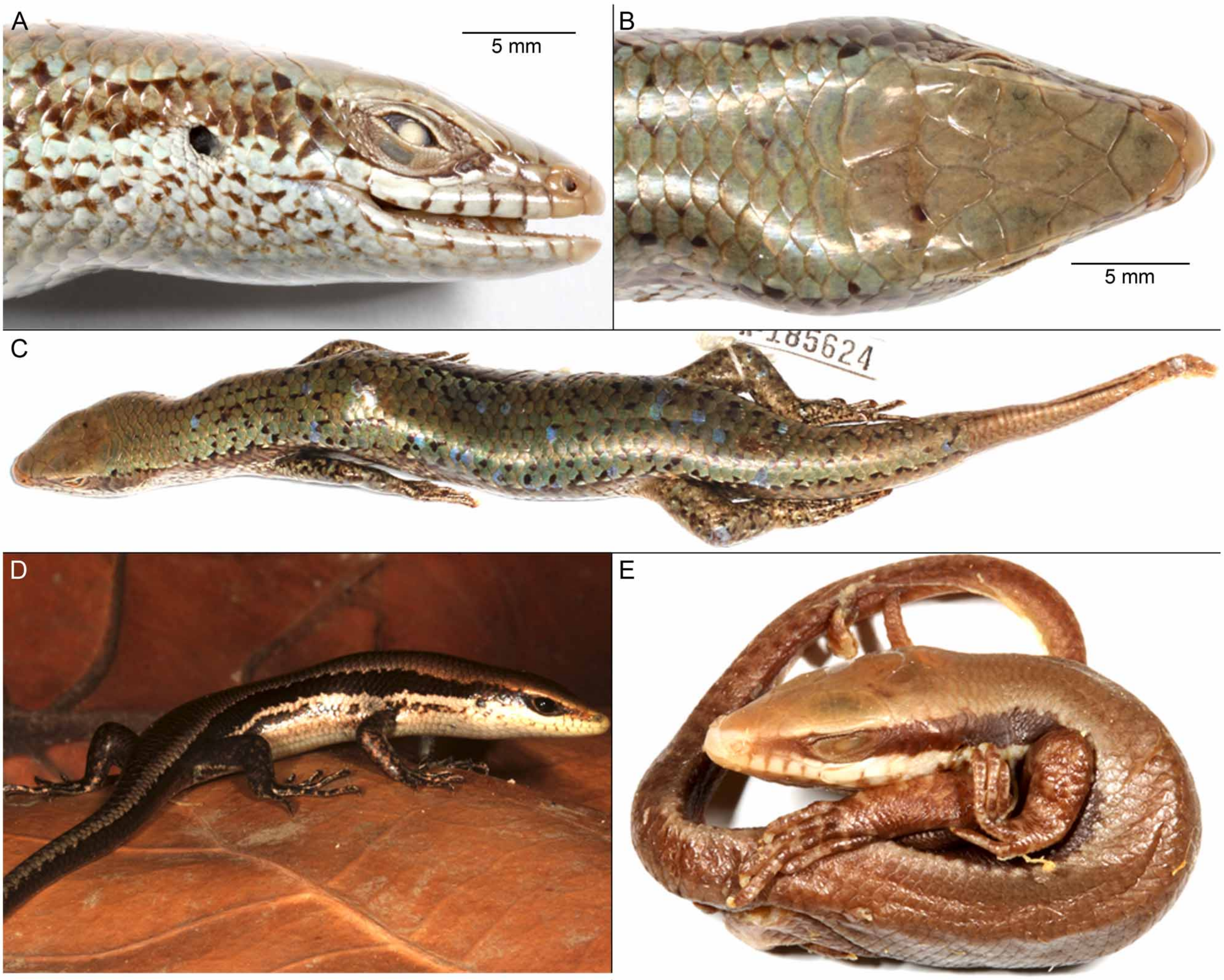

FIGURE 25. *Copeoglossum aurae* **sp. nov.**, from the Lesser Antilles. (A–C) MCZ R-185624, holotype, Kingston, St. George Province, St. Vincent. (D) uncataloged, Union Island, Grenadines (live individual, photographed by M. Rivera in June, 2010). (E) fetus of MCZ R-185626, paratype, Kingston, St. Vincent.

Holotype. MCZ R-185624, an adult male, collected in Kingston, St. George Province, St. Vincent, in April 1886 by W.B. Richardson.

Paratypes (n = 32). Grenada. BMNH 86.6.29.19, G. Murray, "Island of Grenada," 1886; MCZ R-79744, James Lazell, Tempe, 22 June 1964. Grenadines. KU 242047–48, Albert Schwartz, Park, Bequia Island, 18 March 1961; KU 242051, Albert Schwartz, Grand Bay, Mustique Island, 15 December 1961; MCZ R-79097 and R-79099, C. MacIntosh, Carriacou, 1963; MCZ R-79100, George Gorman, Bequia Island, 30 April 1964; USNM 79131, Paul Bartsch, Petit Martinique, 1929. St. Vincent. BMNH 90.11.25.16–17, F. D. Goodman, no specific locality, 1890; CAS 39439, Blake Expedition, Kingston, 18 February 1879; MCZ R-6040, Samuel W. Garmin, Kingston, 18 February 1879; MCZ R-6041, R-185623, R-185625–26, W. B. Richardson, Kingston, April 1886. Trinidad. AMNH R101327, George Campbell, Chaguaramas, February 1943; CAS 39483, C. S. Cazabon, no specific locality, 1879; CAS 231775, R. Lawson *et al.* Manzanilla Beach, 18 July 2004; CM 6565, M. Graham Netting, Manzanilla Beach, 22 September 1927; KU 242013, Albert Schwartz, Nariva, 4 May 1963; MCZ R-6039, Samuel Garmin (no additional information available); MCZ R-8994, R. Thaxter, Port of Spain, April 1913; MCZ R-79818, James D. Lazell, Aripe Savannah, 14 July 1964; UMMZ 79919 and 239606, no specific locality, collector, or date; MCZ R-100481, H. Boos, Huevos Island, 3 May 1966. Tobago. KU 242009–11, Albert Schwartz, 4 miles N Mt. St. George, 12 May 1963; MCZ R-185622, Garth L. Underwood, Scarborough, 5 September 1956.

Diagnosis. *Copeoglossum aurae* **sp. nov.** is characterized by (1) maximum SVL in males, 98.5 mm; (2) maximum SVL in females, 109 mm; (3) snout width, 2.64–3.63% SVL; (4) head length, 16.3–20.7% SVL; (5) head width, 12.5–16.1% SVL; (6) ear length, 1.02–2.19% SVL; (7) toe-IV length, 10.1–12.7% SVL; (8) prefrontals, two; (9) supraoculars, three (3%), four (97%); (10) supraciliaries, four (3%), five (66%), six (31%); (11) frontoparietals, two; (12) supralabial below the eye, six (91%), seven (9%); (13) nuchal rows, one; (14) dorsals, 50–59; (15) ventrals, 54–65; (16) dorsals + ventrals, 106–117; (17) midbody scale rows, 28–32; (18) finger-IV lamellae, 12–14; (19) toe-IV lamellae, 15–18; (20) finger-IV + toe-IV lamellae, 29–32; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (16%), N (84%); (24) parietal contact, Y (3%), N (97%); (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Table 2).

Within the Genus *Copeoglossum*, *C. aurae* **sp. nov.** differs from *C. arajara* (Rebouças-Spieker 1981) in having more finger-IV + toe-IV lamellae (29–32 versus 26 in *C. arajara*), more supraciliaries (5–6 in 97%, four in 3% of *C. aurae* **sp. nov.** versus four, or rarely three or five, in *C. arajara*), and dark palms and soles (pale in *C. arajara*). *Copeoglossum aurae* **sp. nov.** differs from *C. nigropunctatum* in having a narrower frontonasal scale (frontonasal width/length 0.97–1.28 versus 1.30–2.03 in *C. nigropunctatum*; Fig. 26), a shorter supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.38–0.69 in *C. aurae* **sp. nov.** versus 0.68–1.23 in *C. nigropunctatum*; Fig. 27), and supranasals not in contact (in contact in 94% of *C. nigropunctatum*). It differs from *C. margaritae* **sp. nov.** in having a lower number of ventral scales (54–65 versus 66), a shorter supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.38–0.69 in *C. aurae* **sp. nov.** versus 0.75–0.88 in *C. margaritae* **sp. nov.**) (Fig. 27), a smaller body size (109 versus 120 mm maximum SVL), and a longer toe-IV (length 10.1–12.7% SVL versus 9.06%), although the relatively shorter toe-IV in *C. margaritae* **sp. nov.** may be related to its large size. *Copeoglossum aurae* **sp. nov.** also lacks spotting on the chin (present in *C. margaritae* **sp. nov.**). *Copeoglossum aurae* **sp. nov.** differs from *C. redondae* **sp. nov.** in having no contact between the first paired chin shields and infralabials (broad contact in *C. redondae* **sp. nov.**), a smaller ear (ear length 1.02–2.19% SVL versus 2.42% SVL in *C. redondae* **sp. nov.**), and a longer toe-IV (10.1–12.7% SVL versus 9.43% in *C. redondae* **sp. nov.**). Preserved *C. aurae* **sp. nov.** appear to be paler in coloration than *C. nigropunctatum* and *C. margaritae* **sp. nov.**, noted also by Ugueto and Rivas (2010), but that was a character difficult to quantify or classify, especially given the effects of preservation and age on coloration.

Copeoglossum aurae **sp. nov.** also differs in many ways from a sympatric species, *Marisora aurulae* **sp. nov.**, described below, in a different genus. One scale character that may be used to separate them readily is parietal contact (not in contact, or rarely just touching, in *C. aurae* **sp. nov.**; in contact in *M. aurulae* **sp. nov.**). Another involves chin scales in contact with infralabials between postmental and first sublabial. There are none in *C. aurae* **sp. nov.** and 2–4 in *M. aurulae* **sp. nov.** (Fig. 3). In coloration, *C. aurae* **sp. nov.** nearly always has a distinctly spotted dorsum and dark lateral stripes that extend to the hindlimbs and onto the tail (Fig. 24A). *Marisora aurulae* **sp. nov.** usually has a more faded pattern, with smaller dorsal spots and dark lateral stripes that fade posteriorly into ground color.

Description of holotype (Fig. 25A–C). An adult male in good state of preservation, without injuries and with two abdominal slits. SVL 90.7 mm; tail length 64.6 mm (regenerated and broken); HL 17.2 mm; HW 12.1 mm; SW 2.92 mm; EL 1.86 mm; and toe-IV length 10.7 mm; ear-opening large in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, fused with right parietal, not separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Six supraciliaries, five approximately equal in length and the sixth smaller than the others. Nostril in posterior part of the nasal. Postnasal bordered by supranasal, anterior loreal and first and second supralabials. Anterior loreal rectangular and posterior loreal squarish with posterodorsal projection on latter. One upper preocular and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin curved toward the tip of the snout. Postmental scale and zero pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 53 in a longitudinal row; ventrals similar to dorsals; 58 in a longitudinal row; 29 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portion of tail, one enlarged row each of middorsal and midventral scales and 3–4 lateral rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 18 under toe-IV. Five preanals larger than adjacent ventral scales. Enlarged median subcaudal scales on regenerated portion of tail.

Pattern and coloration. Dorsal ground color medium grayish-green with small-to-medium dark brown spots (usually 1/2 to 1/5 of a scale in size), uniformly distributed on body, base of tail, and limbs (limbs more densely spotted and with larger spots). Dark dorsolateral stripes absent. Dark lateral stripes present, brown, irregular (series of close medium and dark brown blotches), extending from loreal region onto tail. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes present, greenish-white, extending from below ear to hindlimbs, bordered below by a series of discontinuous brown spots. Two thin dark brown dorsolateral stripes on regenerated part of tail. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

Variation. In coloration (in preservative), most specimens resembled the holotype, except that dorsal color varies among shades of brown, gray, and green (Table 5). The dorsum of some specimens is heavily spotted, sometimes with dark brown spots aligned dorsolaterally; others have fewer spots. Some specimens have paler areas just above the dark lateral stripes, but on others, the dorsal color is constant.

A photo of a live individual from Union Island, Grenadines is shown here (Fig. 25D). Ugueto and Rivas (2010) noted that skinks from Trinidad and Tobago are paler than those (= *C. nigropunctatum*) from South America. The photo of a skink from near Arima, Trinidad (Murphy 1997) is of *C. aurae* **sp. nov.** (as opposed to *M. aurulae* **sp. nov.**) because it shows separated parietal scales. The greenish hue seen in many preserved specimens is an artifact of preservation, as it is not seen in these live individuals.

Distribution. *Copeoglossum aurae* **sp. nov.** is distributed on Grenada, St. Vincent, the Grenadines (Bequia, Carriacou, Mustique, Petit Martinique, and Union Islands), Trinidad (including Huevos Island), and Tobago (Fig. 11D, I–J). The Union Island record is based on image identification (Fig. 25D). A DNA sequence from an uncataloged specimen collected on the nearby Peninsula de Paria (Sucre, Venezuela), reported by Miralles and Carranza (2010), clusters with this species in our tree (Fig. 5), indicating that the species also occurs on the mainland, possibly restricted to that peninsula. Previous distributional data in the literature (Murphy 1997; Daudin & de Silva 2007) cannot be used because it confounds *C. aurae* **sp. nov.** and *Marisora aurulae* **sp. nov.**

Ecology and conservation. No ecological information is available specifically for this species. Past ecological information reported for skinks from Trinidad and Tobago, summarized in Murphy (1997), probably confounds *Copeoglossum aurae* **sp. nov.** and *Marisora aurulae* **sp. nov.** In those reports, skinks were noted as occurring in a diversity of habitats, including rainforest, forest edge, coconut trash, and cultivated and disturbed areas. In the Grenadines, skinks have been found usually on the ground "in woody underbrush and between cacti" and climbing among cacti and on tree trunks (Daudin & de Silva 2007). According to Barbour (1937), skinks were already extirpated from the large islands of St. Vincent and Grenada by 1937, by the introduced mongoose. However, one specimen of *C. aurae* **sp. nov.** was collected in 1964 at Tempe, Grenada. Many herpetologists have visited Grenada and St. Vincent in the last four decades and no sightings of skinks have been reported. Circumstantial evidence suggests that black rats (*Rattus rattus*) are also predators, and these are on many islands. Skinks have not been extirpated from Trinidad, despite the presence of the mongoose on that island. In the past, Trinidad has had geological connections with South America and has a continental mammalian fauna that included natural predators of skinks, which may explain how they have survived (Murphy 1997). We identified more than twice as many specimens in museums of *C. aurae* **sp. nov.** than of *Marisora aurulae* **sp. nov.**, suggesting that *C. aurae* **sp. nov.** is the more abundant species of the two. Now that these two species have been identified and described, studies are needed to assess their ecological relations and further clarify their conservation status.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Copeoglossum aurae* **sp. nov.** as Vulnerable (VU A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extirpation on Grenada and St. Vincent. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists on Grenada and St. Vincent, the health of any remaining populations, and threats to the survival of the species.

Reproduction. Two females (93.0 and 95.3 mm SVL) contained one and three developing young. The dates of collection for those specimens were 12 May 1963 and 18 March 1961, respectively.

Etymology. The species name (*aurae*) is a feminine genitive singular noun, from the Latin noun *aura* (wind), alluding to its distribution on the Windward Islands (the southern Lesser Antilles, sometimes including Trinidad and Tobago). The term "windward" is in reference to early travel across the Atlantic in sailing ships, which encountered these islands first because of wind direction. The Leeward Islands were those encountered subsequent to the Windward Islands. There has been some confusion over the centuries as to which islands should be called windward and leeward, but those in the southern Lesser Antilles (Saint Vincent, Grenadines, Grenada) have always been called windward (Hedges 2011). The first part of the common name (Greater Windward Skink) refers to the larger body size of this species compared with *M. aurulae* **sp. nov.** (Lesser Windward Skink), described below.

Remarks. The name *Tiliqua* (*Mabuya*) *aenea* (Gray 1831a) does not to apply to this species. We have examined the two syntypes, BMNH 1946.8.15.12 and 1946.8.19.78, and they agree with populations currently placed in *Copeoglossum nigropunctatum* from South America. Both specimens have supranasals in broad contact (typical of *C. nigropunctatum*), whereas all 33 specimens examined of *C. aurae* **sp. nov.** (from throughout its range) lack supranasal contact, something alluded to by Boulenger (1891) when he reported on two specimens of what is here called *C. aurae* **sp. nov.** (BMNH 90.11.25.16–17) from St. Vincent that did not agree with the type of *M. aenea*. Also the ratios of frontonasal width versus length in the two syntypes of *Tiliqua aenea* (1.32 and 1.65) agree with *C. nigropunctatum* (1.30–2.03) and not *C. aurae* **sp. nov.** (0.97–1.28) (Fig. 26). Those syntypes also have 27–28 finger-IV + toe-IV digital lamellae, in agreement with modal values in *C. nigropunctatum* (range, 26–32) and fewer than in specimens of *C. aurae* **sp. nov.** (29–32). Also, one (BMNH 1946.8.15.12) has prefrontal contact, and prefrontals are nearly in contact in the other specimen (BMNH 1946.8.19.78). Prefrontal contact is rare in mabuyines and not present in any *C. aurae* **sp. nov.** examined, but it occurs in *C. nigropunctatum* at a moderate frequency (~20% in those examined). Gray (1831a) described *Tiliqua aenea* from "Brazils," a name generally applied at that time, without precision, to many areas in eastern and northern South America. Later, Gray (1845) listed specimens (now considered the syntypes) "in spirits" from "W. Indies" and "St. Vincents," and "from the Rev. L. Guilding's collection." Because the BMNH register starts in 1837 (Underwood 1993), it is not possible to obtain additional details on types of *Tiliqua aenea* or to clarify the difference in localities noted in Gray (1831a) and Gray (1845). Lansdown Guilding (1797–1831) was born on St. Vincent and is known to have collected plants and animals on that island (Howard & Howard 1985). There is no record that he collected on the mainland of South America, but he was visited by colleagues who did collect material in South America (Howard & Howard 1985), and that may explain the origin of the syntypes of *T. aenea*. Confusion in localities (West Indies versus South America) has been documented for other BMNH specimens of reptiles, including skinks, collected in the early nineteenth century (Underwood 1993; Miralles *et al.* 2009a). We place *Tiliqua aenea* Gray (1831a) in the synonymy of *C. nigropunctatum* Spix (1825). However, given the great genetic diversity of the latter species (see discussion above, in Remarks for *Copeoglossum*), it is likely that the name *Copeoglossum aeneum* will re-emerge in the future as a valid species of South American skink. Miralles *et al.* (2005; 2006b; 2009; 2009) and Miralles and Carranza (2010) examined specimens designated here as *C. aurae* **sp. nov.** but considered them to be members of *C. nigropunctatum*.

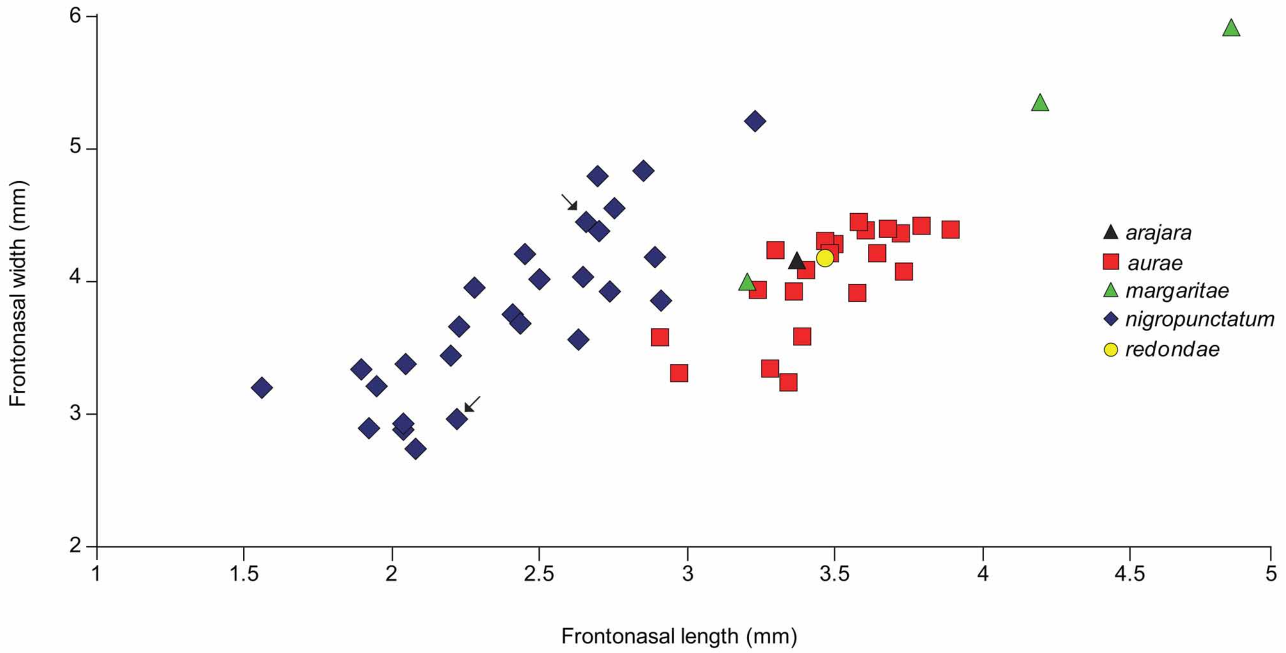

FIGURE 26. Graph of frontonasal width versus frontonasal length in the five species of the Genus *Copeoglossum*. The syntypes of *Tiliqua aenea* Gray (= *Copeoglossum nigropunctatum*) are indicated with arrows.

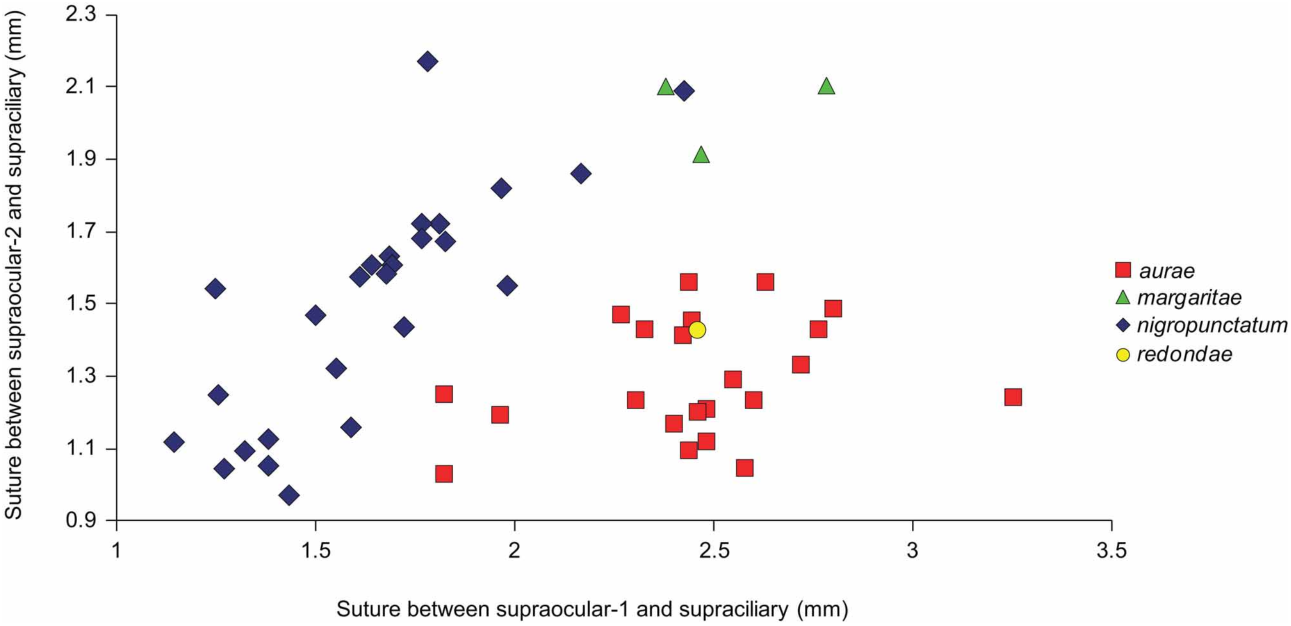

FIGURE 27. Graph of suture length between supraocular-2 and supraciliaries versus that between supraocular-1 and supraciliaries in four species of the Genus *Copeoglossum*. *Copeoglossum arajara* is not included because it has three supraoculars, possibly from fusion between first and second supraoculars.

Copeoglossum aurae **sp. nov.** is broadly sympatric with another new species, *Marisora aurulae* **sp. nov.** (described below). They have remarkably similar distributions, with both occurring on St. Vincent, the Grenadines, Grenada, Trinidad, and Tobago. They are similar in appearance in that both lack dark dorsolateral stripes but have dark lateral stripes. It is not known whether they have similar microhabitats, but they have been taken together at two localities (Carriacou Island, Grenadines and Scarborough, Tobago), each on the same date and by the same collector. The first museum specimens of what is here called *C. aurae* **sp. nov.** turned up nearly 132 years ago, and those of what is here called *Marisora aurulae* **sp. nov.** first appeared about 129 years ago, and old specimens of each are from multiple islands. There is no indication that either species was introduced to the islands or among the islands, and it is unlikely they were a significant food source for native Americans (another possible explanation for distribution among islands). Thus, their current distribution on multiple islands is probably natural, transported by flotsam before the arrival of humans.

Copeoglossum margaritae **sp. nov.**

Margarita Skink
(Figs. 23B, 24B, 28)

Mabuya nigropunctata—Miralles *et al*., 2005:833 (part).
Mabuya nigropunctata—Rivas *et al*., 2005:349 (part).
Mabuya nigropunctata—Miralles *et al*., 2009:609 (part).
Mabuya nigropunctata—Ugueto & Rivas, 2010:208 (part).

Holotype. USNM 217141, an adult female, collected 3 km NE La Asuncion, Margarita Island, Nueva Esparta, Venezuela (11° 03' N, 63° 51' W, 410 m), in February, 1967. Collector unrecorded. Field number SVP 12355 (Smithsonian Venezuelan Project).

Paratypes (n = 2). Margarita Island, Venezuela. MHNLS 3401–02, Cerro Copey (Collected in 1953 by Felipe Martín). Photographs examined.

Diagnosis. *Copeoglossum margaritae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) SVL of holotype female, 118.8 mm; SVL of unsexed paratype MHNLS 3401 (probably female), 121 mm; (3) snout width, 2.93% SVL; (4) head length, 17.1% SVL; (5) head width, 12.6% SVL; (6) ear length, 1.14% SVL; (7) toe-IV length, 9.06% SVL; (8) prefrontals, two (n = 3); (9) supraoculars, four (n = 3); (10) supraciliaries, six (n = 3); (11) frontoparietals, two (n = 3); (12) supralabial below the eye, six (n = 2) or seven (n = 1); (13) nuchal rows, one (n = 2); (14) dorsals, 53–55 (n = 3); (15) ventrals, 66 (n = 2); (16) dorsals + ventrals, 119–120 (n = 2); (17) midbody scale rows, 30–31 (n = 2); (18) finger-IV lamellae, 15–16 (n = 2); (19) toe-IV lamellae, 16–17 (n = 2); (20) finger-IV + toe-IV lamellae, 32–33 (n = 2); (21) supranasal contact, N (n = 3); (22) prefrontal contact, N (n = 3); (23) supraocular-1/frontal contact, N (n = 3); (24) parietal contact, N (n = 2); (25) pale middorsal stripe, N (n = 3); (26) dark dorsolateral stripe, N (n = 3); (27) dark lateral stripe, Y (n = 3); (28) pale lateral stripe, Y (n = 3); and (29) palms and soles, dark (n = 3); data based on holotype unless indicated (Tables 3–5).

Within the Genus *Copeoglossum*, *C. margaritae* **sp. nov.** differs from all other species by having a higher number of ventral scales (66 versus 54–65 in other species), a larger body size (121 mm maximum SVL versus 100–113 mm maximum SVL), and chin spotting (absent in the other species). It differs from *C. arajara* (Rebouças-Spieker 1981), additionally, in having more finger-IV + toe-IV lamellae (32–33 versus 26), more supraciliaries (six versus 3–5), and dark palms and soles (pale in *C. arajara*). It differs from *C. aurae* **sp. nov.**, additionally, by having a longer supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.75–0.88 in *C. margaritae* **sp. nov.** versus 0.38–0.69 *C. aurae* **sp. nov.**) (Fig. 27) and in having a shorter toe-IV (9.06% SVL versus 10.1–12.7% SVL). It differs from *C. nigropunctatum*, additionally, in having a narrower frontonasal scale (frontonasal width/length 1.20–1.26 (n = 3) versus 1.30–2.03 in *C. nigropunctatum*; Fig. 26), by lacking supranasal contact (in contact in 94% of *C. nigropunctatum*), and by having a high number (32–33) of finger-IV + toe-IV lamellae (versus 94% of *C. nigropunctatum* with fewer than 32 lamellae). It differs from *C. redondae* **sp. nov.**, additionally, by having a longer supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.75–0.88 in *C. margaritae* **sp. nov.** versus 0.58 in *C. redondae* **sp. nov.**; Fig. 27), more finger-IV + toe-IV lamellae (32–33 versus 29), and a smaller ear (ear length 1.14% SVL versus 2.42% in *C. redondae* **sp. nov.**).

Description of holotype (Figs. 23B, 28). An adult female in excellent state of preservation, with a small ventral injury and an abdominal slit. SVL 118.8 mm; tail length 135 mm (regenerated); HL 20.3 mm; HW 15.0 mm; SW 3.48 mm; EL 1.35 mm; and toe-IV length 10.8 mm; ear-opening small in size and round; toe length in the following order: I < V < II < III < IV.

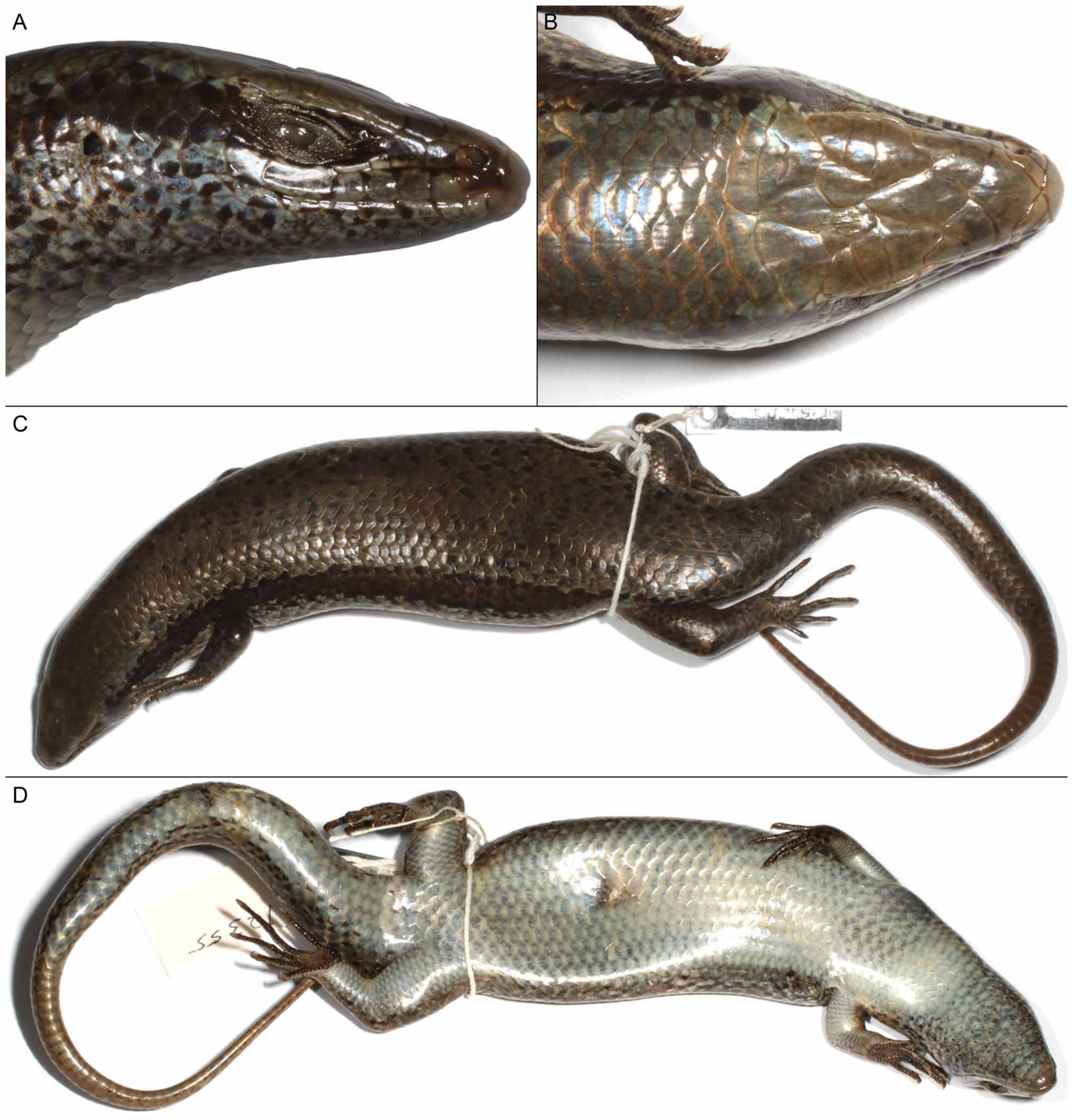

FIGURE 28. *Copeoglossum margaritae* **sp. nov.**, from Isla de Margarita. (A–D) USNM 217141, holotype, 3 km NE La Asuncion, Margarita Island, Nueva Esparta, Venezuela (11° 03' N, 63° 51' W).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal roughly pentagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal roughly tetragonal and lanceolate, not separated from nuchals by parietals; parietal eye distinct. Parietals in contact with primary postocular and upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Six supraciliaries, approximately equal in length (third largest, fifth and sixth smallest). Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial (left) and first and second supralabials (right). Anterior and posterior loreals squarish with posteromedial projection on latter. Three upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals on the right and four on the left; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and zero pairs of chin shields in contact with anterior infralabials. Two pairs of chin shields in contact medially.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 54 in a longitudinal row; ventrals similar to dorsals; 66 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portion of tail, one row each of enlarged middorsal and midventral scales with 1–2 lateral scale rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 15 under finger-IV and 17 under toe-IV. Six preanals, with scales similar to ventrals.

Pattern and coloration. Dorsal ground color dark grayish-brown with small-to-medium dark brown spots distributed on body, tail, and limbs (limbs more densely spotted and mottled). Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region to tail. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes present, whitish, extending from below eye to hindlimbs, bordered below by a series of irregular dark brown spots. The entire chin is patterned with small dark brown spots and flecks. The remainder of the ventral surface is unpatterned. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

Variation. Measurements and other morphological data for the holotype and (where available) paratypes are presented in Tables 3–5. Examination of the paratypes (unsexed) was made using photographs. Both paratypes had major ventral incisions and some damage to dorsal scalation, precluding the scoring of some characters. Measurement of SVL from images was done by following the curvature of the specimens, and checked by measuring from dorsal and ventral views. Ugueto and Rivas (2010) considered the mabuyine skinks on Margarita to belong to *C. nigropunctatum*, but they noted paler coloration in individuals from the island.

Distribution. The species is distributed on Isla de Margarita (920 km^2), Venezuela (Fig. 9D).

Ecology and conservation. Ugueto and Rivas (2010) report, concerning the occurrence of this species on Isla de Margarita, that "it has been found in premontane evergreen and cloud forests at 200–700 m. Although frequently observed on the ground, this skink is also occasionally observed perched on tree trunks, shrubs, and bushes." Ecological notes associated with the holotype (provided by the USNM) indicate that it was taken on a ridge top in moist evergreen forest scrub, captured at night under partly cloudy skies with a light breeze. The island continues to be developed as a tourist destination, domestically and internationally. A critically endangered primate, *Cebus apella margaritae*, occurs on the island, and one of the reasons it is threatened is because of forest fragmentation and "ongoing habitat loss" (IUCN 2011).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Copeoglossum margaritae* **sp. nov.** as Vulnerable (VU A2ac). It faces a primary threat from habitat alteration (as for the primate). Its apparent preferred habitat (montane forest) is only a small portion of the island (and is shrinking because of development), and the small number of specimens (three) in museums suggests that it is uncommon. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species.

Reproduction. The female holotype does not contain developing young, which is perhaps consistent with its capture in the mountains (410 m) during February. Notes on reproduction in Ugueto and Rivas (2010), for *C. nigropunctatum*, apparently are not specific to this species on Isla de Margarita.

Etymology. The species name (*margaritae*) is a feminine genitive singular noun and refers to the distribution of the species on the island of Margarita.

Remarks. The fact that two of the three known specimens of *Copeoglossum margaritae* **sp. nov.** are larger than any other species in the Subfamily Mabuyinae further supports its distinction and suggests that this species may reach an even larger size. Also, that it is found on an island is consistent with the general pattern of body size extremes often evolving on islands. Apparently this is because there are more open ecological niches on islands—whether from excess extinction or the filtering effect of overwater dispersal—permitting species that are present to evolve larger or smaller body sizes (Hedges 2008). The size difference is even more remarkable given that the species with which *C. margaritae* **sp. nov.** has been confused, *Copeoglossum nigropunctatum*, is widespread in South America and known from many hundreds of museum specimens, yet the largest specimen of that species (113 mm SVL) is smaller (Avila-Pires 1995). Miralles *et al.* (2005a, 2006b, 2009), Rivas *et al.* (2005), and Miralles and Carranza (2010) examined specimens (MHNLS 3401–02) designated here as *C. margaritae* **sp. nov.** but considered them to be members of *C. nigropunctatum*. USNM 217141, which was collected much earlier, was not examined or noted by those authors.

Copeoglossum redondae sp. nov.

Redonda Skink
(Figs. 23C, 24C, 29)

Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:38 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002: 267 (part).
Mabuya sloanii—Henderson & Powell, 2009:293.

Holotype. ANSP 9517, an adult female, collected on Redonda in 1863–1873 (see Remarks), and donated to the Academy of Natural Sciences of Philadelphia by Dr. Hendrik van Rijgersma.

Diagnosis. *Copeoglossum redondae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 100.1 mm (only specimen); (3) snout width, 2.89% SVL; (4) head length, 16.1% SVL; (5) head width, 14.1% SVL; (6) ear length, 2.42% SVL; (7) toe-IV length, 9.43% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, five (50%), six (50%); (11) frontoparietals, two; (12) supralabial below the eye, five (50%), six (50%); (13) nuchal rows, one; (14) dorsals, 53; (15) ventrals, 59; (16) dorsals + ventrals, 112; (17) midbody scale rows, 30; (18) finger-IV lamellae, 14; (19) toe-IV lamellae, 15; (20) finger-IV + toe-IV lamellae, 29; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, N; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (possibly darkened by preservative) (Tables 3–5).

Within the Genus *Copeoglossum*, *C. redondae* **sp. nov.** differs from all other species except *C. nigropunctatum* by having a larger auricular opening (ear length 2.42% SVL versus 1.02–2.19% in those other species). It differs from *C. nigropunctatum* by having a narrower frontonasal scale (frontonasal width/length 1.20 versus 1.30–2.03 in *C. nigropunctatum*) (Fig. 26), a shorter supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.58 in *C. redondae* **sp. nov.** versus 0.68–1.23 in *C. nigropunctatum*; Fig. 27), and supranasals not in contact (in contact in 94% of *C. nigropunctatum*). *Copeoglossum redondae* **sp. nov.** differs from *C. arajara* (Rebouças-Spieker 1981) in having more finger-IV + toe-IV lamellae (29 versus 26) and more supraciliaries (5–6 versus four, or rarely three or five, in *C. arajara*). *Copeoglossum redondae* **sp. nov.** differs from *C. aurae* **sp. nov.** in having broad contact between the first paired chin shields and infralabials (no contact in *C. aurae* **sp. nov.**) and a shorter toe-IV (9.43% SVL versus 10.1–12.7%). *Copeoglossum redondae* **sp. nov.** differs from *C. margaritae* **sp. nov.** in having a lower number of ventral scales (59 versus 66), a shorter supraocular-2 scale (supraocular-2/supraocular-1 length ratio 0.58 in *C. redondae* **sp. nov.** versus 0.75–0.88 in *C. margaritae* **sp. nov.**; Fig. 27), and a smaller body size (100 mm versus 121 mm maximum SVL). We place *C. redondae* **sp. nov.** in the genus *Copeoglossum* because it has diagnostic traits of that genus (see above), especially the separation of the parietal scales and low dorsal + ventral scale count. It also has dark dorsal spots (no dorsolateral stripes) and dark lateral stripes extending onto tail, both characteristics of the genus.

Description of holotype (Figs. 23C, 29). An adult female in good state of preservation, without injuries and with an abdominal slit. SVL 100.1 mm; tail length 145.5 mm (complete, never regenerated, but in two separate pieces); HL 16.1 mm; HW 14.1 mm; SW 2.89 mm; EL 2.42 mm; and toe-IV length 9.44 mm; ear-opening large in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, not separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Six (left) and five (right) supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Seven (right) and eight (left) supralabials, the fifth (right) and sixth (left) being the widest and forming the lower border of the eyelid. Two moderately enlarged scales behind eye comprising the postoculars on the right and three on the left; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields (plus one additional left chin shield) in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 53 in a longitudinal row; ventrals similar to dorsals; 59 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 15 under toe-IV. Four preanals larger than adjacent ventral scales. Enlarged median subcaudal scales on tail.

Pattern and coloration. The pattern is present but considerably faded from many years in preservative. Dorsal ground color pale brown with medium brown spots, distributed on body and limbs (limbs are more densely spotted and mottled). Dark dorsolateral stripes absent. Dark lateral stripes present, medium brown, extending from loreal region to last third of body and onto tail. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes present, pale tan, extending from behind eye to hindlimbs, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces pale brown to medium brown, similar to ground color. No information is available on color in life of the holotype.

Variation. No other specimens are known. Measurements and other morphological data for the holotype are presented in Tables 3–5.

Distribution. The species is distributed on Redonda (Fig. 11E), only ~2 km^2.

Ecology and conservation. No ecological information is available. Guano mining took place on Redonda from 1869 to about 1920, during which time the island was inhabited. Since then it has been uninhabited, but there are feral goats (*Capra aegagrus* Erxleben) and black rats (*Rattus rattus*) (Daltry 2007), which have almost certainly disturbed the habitat. No individuals have been seen since the holotype was collected.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Copeoglossum redondae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from predation by introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists.

Reproduction. The adult female holotype does not contain developing young.

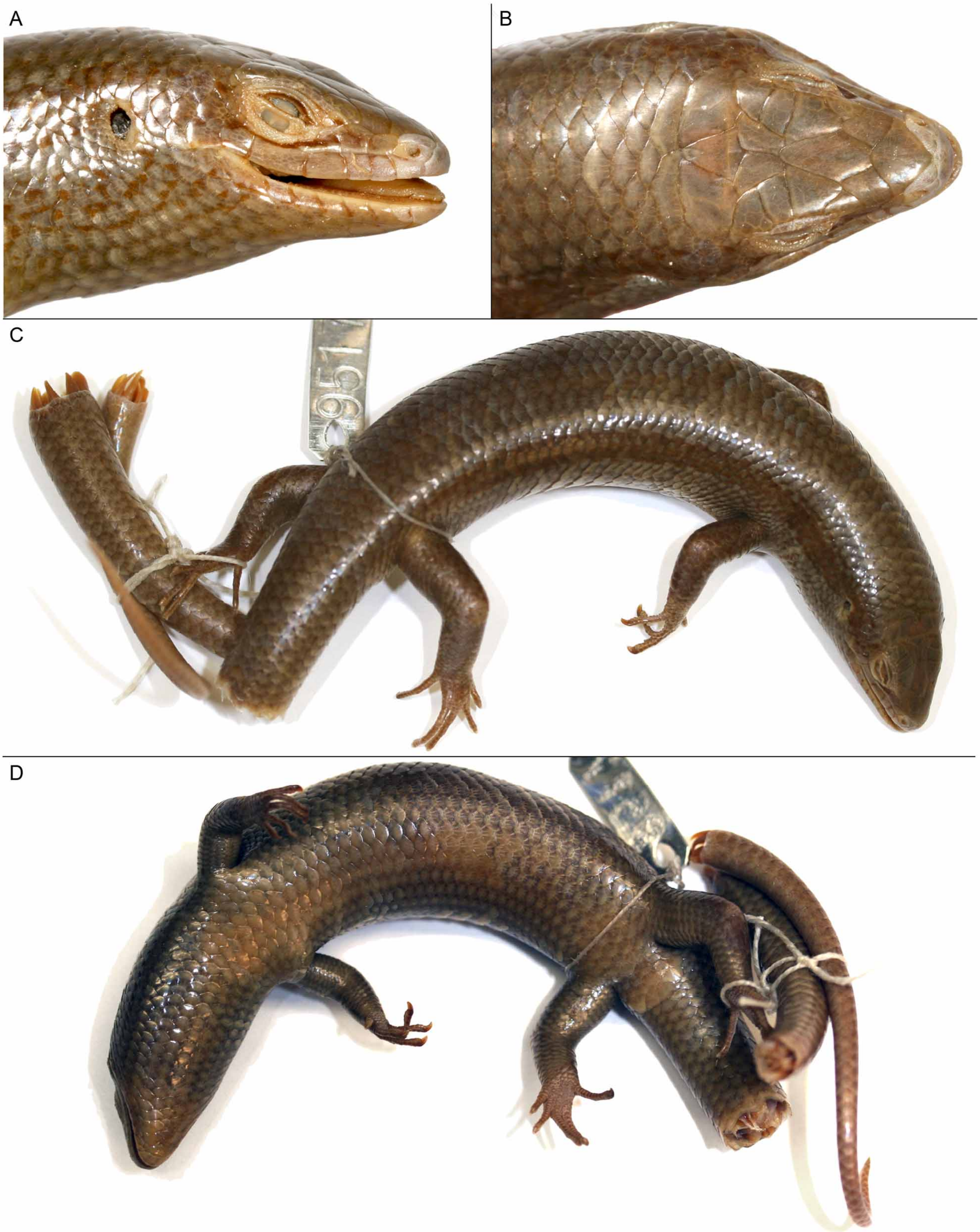

FIGURE 29. *Copeoglossum redondae* **sp. nov.**, from Redonda. (A–D) ANSP 9517, holotype, Redonda (no specific locality).

Etymology. The species name (*redondae*) is a feminine genitive singular noun and refers to the distribution of the species on the island of Redonda.

Remarks. The donor and probable collector, Hendrik E. van Rijgersma (1835–1877), was a Dutch naturalist and physician who practiced medicine on St. Martin during 1863–1877 (Holthius 1959). He collected plants and animals and sent the latter to the Academy of Natural Sciences, Philadelphia. They were received by Edward Drinker Cope, who acknowledged the collection (Holthius 1959). No information is associated with this specimen other than the island and the donor, but we note that the date of collection can be constrained by a notice published in 1873 (Leidy 1873) stating that a "jar containing a collection of small vertebrates and some invertebrates, from the Isle Redowda, W.I., was presented by Dr. R. E. Van Rijgersma." Despite the misspellings, this certainly refers to H. E. van Rijgersma and Redonda Island. Dunn mentioned this specimen in the first sentence of his revision of "American Mabuyas" (Dunn 1936): "the following notes are an attempt to name Mabuyas from the islands of St. Martin, Redonda, and Marie Galante, in the collection of the Academy."

Miralles (2005) considered "*M. mabouya*" to be "the most southern species in the Lesser Antilles" and "endemic to Dominica, Guadeloupe, Martinique and St. Lucia," but he did not mention or discuss the skinks from northern islands (St. Martin, Redonda or Montserrat) or those south of St. Lucia (St. Vincent, Grenadines, and Grenada).

Genus *Exila* gen. nov.

Amazonian Gracile Skinks

Type species. *Mabuya nigropalmata* Andersson, 1918:8.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, one, (2) supraciliaries, five, (3) supraoculars, four, as reported in original description (Andersson 1918), but supraoculars were not reported by Miralles *et al.* (2009), (4) prefrontal contact, present, (5) parietal contact, present, (6) rows of nuchals, 2–3, (7) dorsals + ventrals, undetermined (46–58 dorsals and 30–47 ventrals as reported by Miralles *et al.*, 2009a, but those counts were made using a different counting method than used here), (8) total lamellae, not reported, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. Body size was not reported by Miralles *et al.* (2009), but Andersson (1918) noted in the original description that the largest specimen was 60 mm SVL (Table 2).

Having a single (fused) frontoparietal separates *Exila* from all others except *Notomabuya* and *Panopa* (single frontoparietal) and *Aspronema* (1–2 frontoparietals). Contact between the prefrontals separates *Exila* from *Brasiliscincus*, *Capitellum*, *Notomabuya*, and *Psychosaura* (no contact) and from *Alinea*, *Aspronema*, *Copeoglossum*, *Mabuya*, *Manciola*, *Maracaiba*, and *Marisora* (contact only rarely). From *Aspronema*, *Brasiliscincus*, *Manciola*, *Orosaura*, *Panopa*, *Psychosaura*, and *Spondylurus*, it is distinguished by the absence of dark dorsolateral stripes. It differs from *Brasiliscincus*, *Capitellum*, *Copeoglossum*, *Manciola*, *Maracaiba*, *Notomabuya*, *Orosaura*, and *Varzea* by having more than one pair of nuchals.

Content. A single species is placed in this genus: *Exila nigropalmata* (Table 1).

Distribution. This genus is distributed in the Western Amazonian Basin and on the eastern slopes of the Andes, in Bolivia, Brazil, and Peru (Miralles *et al.* 2009a; Fig. 8C).

Etymology. The generic name (*Exila*) is a feminine noun derived from the Latin adjective *exilis* (lean), alluding to the thin body shape and unusually low number of midbody scale rows in this species (24–28).

Remarks. The single species placed in this genus, *Exila nigropalmata*, was found to be a unique and divergent lineage in published molecular phylogenies (Miralles *et al.* 2009a; Miralles & Carranza 2010) and in our tree (Fig. 5). Its phylogenetic position has not yet been firmly established among the various generic clades (e.g., *Copeoglossum*, *Spondylurus*). Its possession of a unique mix of characters (one frontoparietal, contact of prefrontals, multiple nuchals, five supraciliaries, no dark dorsolateral stripes, high number of toe-IV lamellae, and thin body shape) separate it from all other genera. Recently collected material (Miralles *et al.* 2009a) added knowledge to the systematics, distribution, and natural history of this otherwise poorly known species and genus.

Genus *Mabuya* Fitzinger, 1826

Antillean Two-lined Skinks

Mabuya Rafinesque, 1815:76 (*nomen nudum*).

Mabuya Fitzinger, 1826:23. Type species: *Lacerta mabouya* Bonnaterre, 1789:51 by absolute tautonymy (not *Lacertus mabouya* Lacèpede, 1788: 378; see ICZN, 2005, Opinion 2104).

Mabuia—Cuvier, 1829:64 (unjustified emendation).
Mabouya—Duméril & Bibron, 1839:579 (unjustified emendation).
Mabouya—Gray, 1845:93 (unjustified emendation).
Mabuia—Cope, 1862:185 (unjustified emendation).
Mabuia—Boulenger, 1887:150 (unjustified emendation).
Mabuia—Cope, 1900:616 (unjustified emendation).
Mabuia—Meerwarth, 1901:37 (unjustified emendation).
Mabuya—Taylor, 1956:295 (part).
Mabuya—Greer, 1970:172 (part).
Mabuya—Mausfeld *et al.*, 2002:288.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, four (occasionally three, five, or six), (3) supraoculars, three, in at least some individuals of all species, with two occurring in some individuals of *Mabuya grandisterrae* **sp. nov.** and *M. guadeloupae* **sp. nov.**, and four occurring in some individuals of *M. mabouya* and *M. dominicana*, (4) prefrontal contact, absent (or contact rarely), (5) parietal contact, present, (6) rows of nuchals, one (occasionally two), (7) dorsals + ventrals, 116–138, (8) total lamellae, 211–253, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent (thin line on nape in *M. guadeloupae* **sp. nov.** and in some *M. dominicana*), (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. Most species are large, with a range of maximum body sizes among the species of 92.3–106 mm SVL (Table 2).

The presence of three supraoculars (usually) distinguishes this genus from all others except *Aspronema*, although three supraoculars appears rarely in *Copeoglossum*, *Marisora*, *Notomabuya*, and *Spondylurus*. The absence of dark dorsolateral stripes (except thin line on nape in *M. guadeloupae* **sp. nov.** and in some *M. dominicana*) distinguishes this genus from *Aspronema*, *Manciola*, *Orosaura*, *Panopa*, *Psychosaura*, and *Spondylurus*. The presence of two frontoparietals (instead of one) distinguishes this genus from *Exila*, *Notomabuya*, and *Panopa*. The presence of four supraciliaries (rarely three, five, or six) distinguishes *Mabuya* from *Brasiliscincus*, *Capitellum*, and *Exila* (5–6 supraciliaries). Contact of the parietal scales distinguishes *Mabuya* from *Copeoglossum*.

Content. Eight species are placed in this genus: *Mabuya cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, *M. dominicana*, *M. grandisterrae* **sp. nov.**, *M. guadeloupae* **sp. nov.**, *M. hispaniolae* **sp. nov.**, *M. mabouya*, and *M. montserratae* **sp. nov.** (Table 1).

Distribution. This genus is restricted to the West Indies, occurring in the Greater Antilles (Hispaniola) and Lesser Antilles (Montserrat, Guadeloupe, Dominica, and Martinique; Figs. 1, 8A, 9B, and 11B–C, E–F).

Etymology. The generic name *Mabuya* is a feminine noun derived from the same name used by native peoples of the Americas, especially the Antilles, for various types of lizards.

Remarks. This is a cohesive, well-defined clade of large skinks, with a combination (usually) of three supraoculars, parietal contact, and two dark lateral stripes (Figs. 30–32). Seven of the eight species occupy adjacent islands in the central core of the Lesser Antilles, and the eighth occurs on Hispaniola. Aside from the species on Dominica, they are rarely seen, and three (*Mabuya hispaniolae* **sp. nov.**, *M. mabouya*, and *M. montserratae* **sp. nov.**) may be extinct. Sequence data are available for only one species (*M. dominicana*). We hesitate drawing any conclusions from the morphological data regarding relationships among the eight species. However, it is clear that the geographically disjunct *M. hispaniolae* **sp. nov.** is closely related to the other seven species. Water currents in the central and northern Lesser Antilles would carry flotsam directly to Hispaniola in a relatively short period of time, and this is the best explanation for the origin of *M. hispaniolae* **sp. nov.**

There has been some confusion in the literature regarding the extent of the distribution of the two-lined skinks (formerly "*M. m. mabouya*" or "*M. mabouya*"; here primarily the Genus *Mabuya*) and four-lined skinks (formerly "*M. m. sloanii*" or "*M. sloanii*"; here primarily the Genus *Spondylurus*). Dunn (1936) considered skinks from St. Martin, part of the Anguilla Bank in the northern Lesser Antilles, to be intermediate between his races of "*Mabuya mabouya*". He did this because of their possession of dark dorsolateral stripes (a "*M. mabouya sloanii*" character) and mix of characters from both races (three and four supraoculars, one and > 1 nuchal rows). Schwartz and Thomas (1975) essentially followed Dunn, but inexplicably assigned a break in the distributions to the Lesser Antilles (*M. m. mabouya*) and Greater Antilles (*M. m. sloanii*) and thus included skinks of the Anguilla Bank in *M. m. mabouya*, for which there was no evidence. This was carried through in later taxonomic summaries (Schwartz & Henderson 1988; Schwartz & Henderson 1991). Breuil (2002) correctly included "*M. sloanii*" (= *Spondylurus* here) for the Anguilla Bank but assumed that the previous authors were correct about *M. mabouya* being there as well, so he indicated, incorrectly, that both taxa were sympatric on the Anguilla Bank. Lorvelec *et al.* (2007) then followed Breuil in showing sympatry. Finally, Miralles (2005) considered *M. mabouya* to be "the most southern species in the Lesser Antilles" and "endemic to Dominica, Guadeloupe, Martinique and St. Lucia," but he did not mention what species he thought occurred on Redonda or Montserrat, and, separately, he overlooked that skinks also occur on islands south of St. Lucia (St. Vincent, Grenadines, and Grenada). In part because of that error, Henderson and Powell (2009) incorrectly considered the skinks of Redonda and Montserrat to be allied with *M. sloanii*. But Dunn (1936), who started this chain reaction of errors, was not correct about the skinks of the Anguilla Bank. They have four stripes and other characters that ally them with the four-lined clade, *Spondylurus*, and are genetically members of that genus (Fig. 5).

***Mabuya cochonae* sp. nov.**
Cochons Skink
(Figs. 30A, 32A, 33)

Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:38 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:84 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. KU 242043, an adult male, collected by Albert Schwartz and Richard Thomas on Îlet à Cochons, Guadeloupe, on 30 January–3 February 1963.

Paratype (n = 1). Guadeloupe. KU 242044, an adult female, same locality and information as the holotype.

Diagnosis. *Mabuya cochonae* **sp. nov.** is characterized by (1) maximum SVL in males, 96.7 mm; (2) maximum SVL in females, 98 mm; (3) snout width, 2.68–2.78% SVL; (4) head length, 18.7–19.1% SVL; (5) head width, 12.8–13.1% SVL; (6) ear length, 1.02–1.12% SVL; (7) toe-IV length, 11.1–11.6% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, one; (14) dorsals, 58–62; (15) ventrals, 70; (16) dorsals + ventrals, 128–132; (17) midbody scale rows, 32; (18) finger-IV lamellae, 12–14; (19) toe-IV lamellae, 17; (20) finger-IV + toe-IV lamellae, 29–31; (21) supranasal contact, Y; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, N; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. cochonae* **sp. nov.** and the other three species inhabiting Guadeloupe and its islets (*M. desiradae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, and *M. guadeloupae* **sp. nov.**), here placed in the *M. guadeloupae* **sp. nov.** species group, have a similarly-proportioned frontonasal scale that distinguishes them from other species in the genus (Fig. 34). Species in the *M. guadeloupae* **sp. nov.** species group have a longer frontonasal compared with *M. montserratae* **sp. nov.** (frontonasal length/head length 0.176–0.199 versus 0.165–0.168) and a shorter frontonasal compared with other species in the genus (0.176–0.199 versus 0.205–0.239 in *M. dominicana*, *M. hispaniolae* **sp. nov.**, and *M. mabouya*). In addition, *M. cochonae* **sp. nov.** differs from *M. dominicana* by having a shorter, wider supranasal scale (supranasal length/supranasal width 3.13–3.25 versus 4.57–6.57 in *M. dominicana*; Fig. 35), and in lacking a well-defined dorsolateral and pale lateral stripe (present in 84% of *M. dominicana*). It is separated from *M. hispaniolae* **sp. nov.** and *M. mabouya* by having supranasal contact (versus no contact in all *M. hispaniolae* **sp. nov.** and in 88% of *M. mabouya*). It differs from *M. montserratae* **sp. nov.** by having a higher supraciliary-2/supraciliary-3 length ratio (2.14–2.20 versus 1.39–1.66 in *M. montserratae* **sp. nov.**; Fig. 36).

Mabuya cochonae **sp. nov.** differs from the other three species in the *M. guadeloupae* **sp. nov.** species group in having a longer anterior loreal scale (2.26–2.47% SVL versus 1.28–1.99% SVL; Fig. 37), a longer suture length between the upper secondary temporal and the parietal scale (2.12–2.29% SVL versus 1.36–2.01% SVL; Fig.

37C), and a smaller ear (1.02–1.12% SVL versus 1.26–2.08% SVL). Each of the two specimens has contact between anterior loreal and supraciliary-1 scales on one side of the head (versus no contact in the other three species of the group); such contact is rare in the genus. Additionally, it differs from each of the species in other ways. From *M. desiradae* **sp. nov.**, *M. cochonae* **sp. nov.** differs in having a smaller separation of the prefrontal scales (0.89–1.16% SVL versus 1.74–1.75% SVL), a shorter dark lateral stripe that extends only to the forelimbs (versus midbody), an orange (versus dull silvery-gray) venter in life, a head that is less red in life, and weakly-defined, pale dorsolateral stripes that extend only one-third (versus two-thirds) of the body. It differs from *M. grandisterrae* **sp. nov.** by having a higher supraciliary-2/supraciliary-3 length ratio (2.14–2.20 versus 1.67–1.79; Fig. 36). From *M. guadeloupae* **sp. nov.**, *Mabuya cochonae* **sp. nov.** differs in having a longer interloreal suture (0.91–1.03% SVL versus 0.64–0.85% SVL; Fig. 37B), having a longer supralabial-7 (1.68–1.87% SVL versus 1.36–1.44% SVL; Fig. 37D) and lacking dark dorsolateral stripes and well-defined pale lateral and dorsolateral stripes (those stripes being present in *M. guadeloupae* **sp. nov.**).

Description of holotype (Figs. 30A, 33A–D). An adult male in good state of preservation, without injuries and with an abdominal slit. SVL 96.7 mm; tail complete (length not measured); HL 18.5 mm; HW 12.7 mm; SW 2.69 mm; EL 1.08 mm; and toe-IV length 11.2 mm; ear-opening small in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale (left side only). A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, anterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the first supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posteromedial projection on latter. Two (left) or three (right) upper preoculars and one (right) or two (left) lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but usually smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by smaller cycloid scales.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 70 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 12 under finger-IV and 17 under toe-IV. Four preanals larger than adjacent ventral scales. Median subcaudal scales gradually increasing in size from base to tip of tail.

Pattern and coloration. Dorsal ground color dark brown with a few small darker brown spots, distributed on body above the pale dorsolateral stripes, and on the limbs (the latter having a darker ground color). Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, irregular, extending from loreal region to above forelimbs. Pale middorsal stripe absent. Pale dorsolateral stripes present, medium gray, extending from nuchal area to first third of body. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. Only the ventral coloration in life (orange) has been recorded for the holotype (Albert Schwartz field notes at KU).

Variation. In coloration and scalation, the paratype resembled the holotype, except that the field notes of Albert Schwartz indicated the paratype venter was orange "but a bit darker" than that of the holotype (Tables 4–5).

Distribution. The species is known only from Îlet à Cochons (0.2 km^2), Guadeloupe (Fig. 11B).

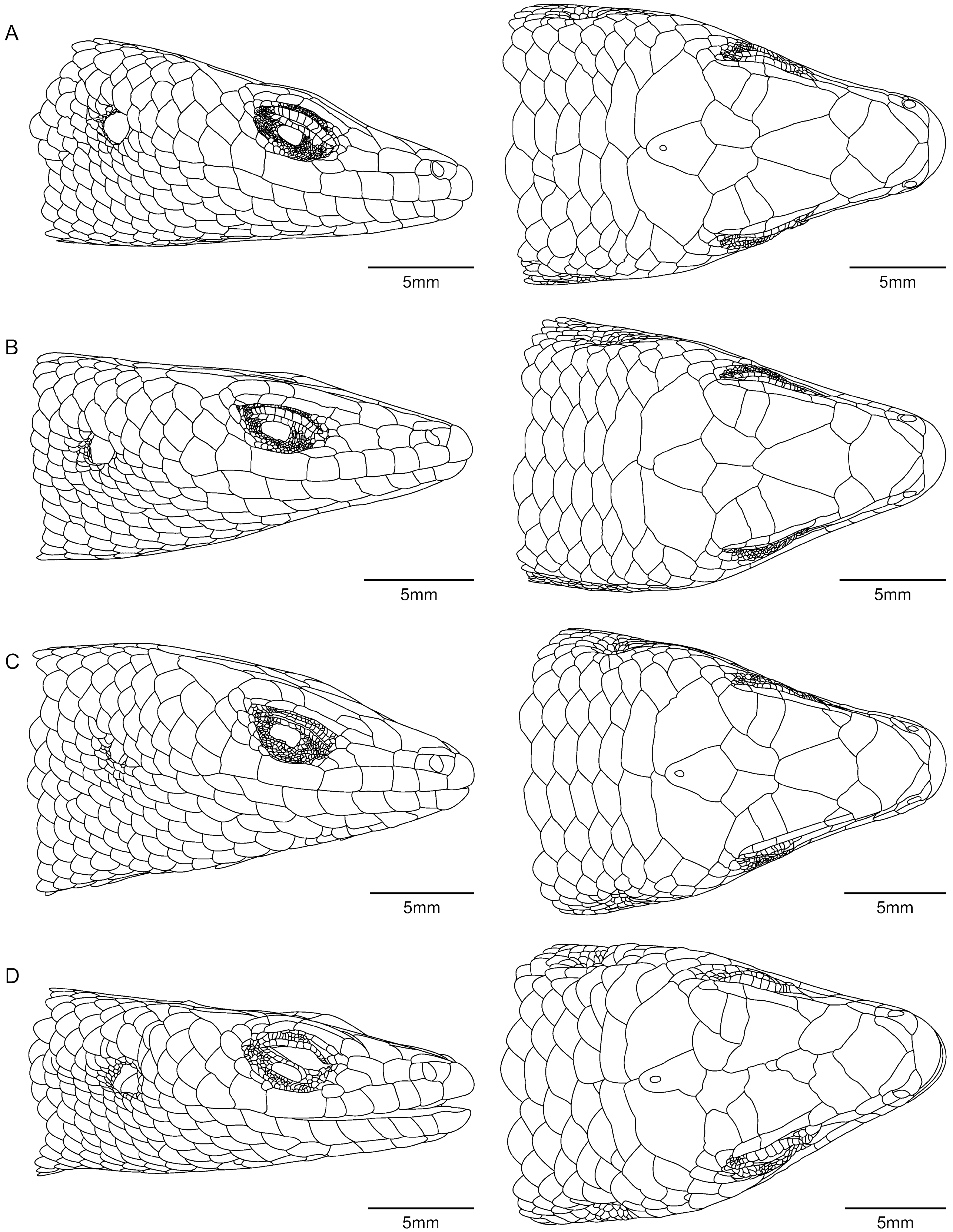

FIGURE 30. Head scalation in species of the Genus *Mabuya* (left, side view; right, dorsal view). (A) *M. cochonae* **sp. nov.** (KU 242043, holotype); (B) *M. desiradae* **sp. nov.** (KU 242045, holotype); (C) *M. dominicana* (MCZ R-182281); and (D) *M. grandisterrae* **sp. nov.** (BMNH 1920.1.20.398, holotype).

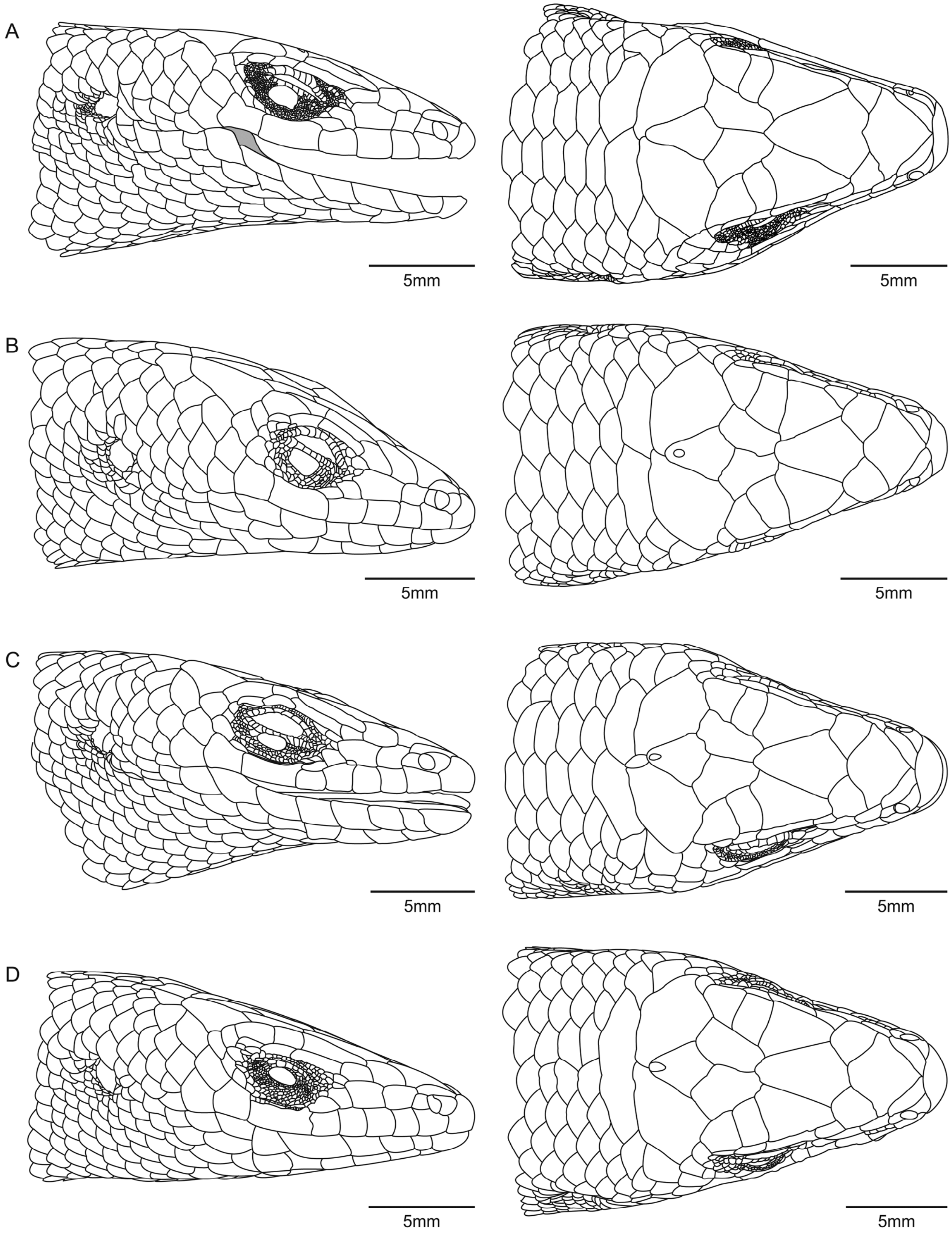

FIGURE 31. Head scalation in species of the Genus *Mabuya*, continued (left, side view; right, dorsal view). (A) *M. guadeloupae* **sp. nov.** (FMNH 213, holotype); (B) *M. hispaniolae* **sp. nov.** (UMMZ 83305, holotype); (C) *M. mabouya* (BMNH 53.2.4.39); and (D) *M. montserratae* **sp. nov.** (MCZ R-125464, holotype).

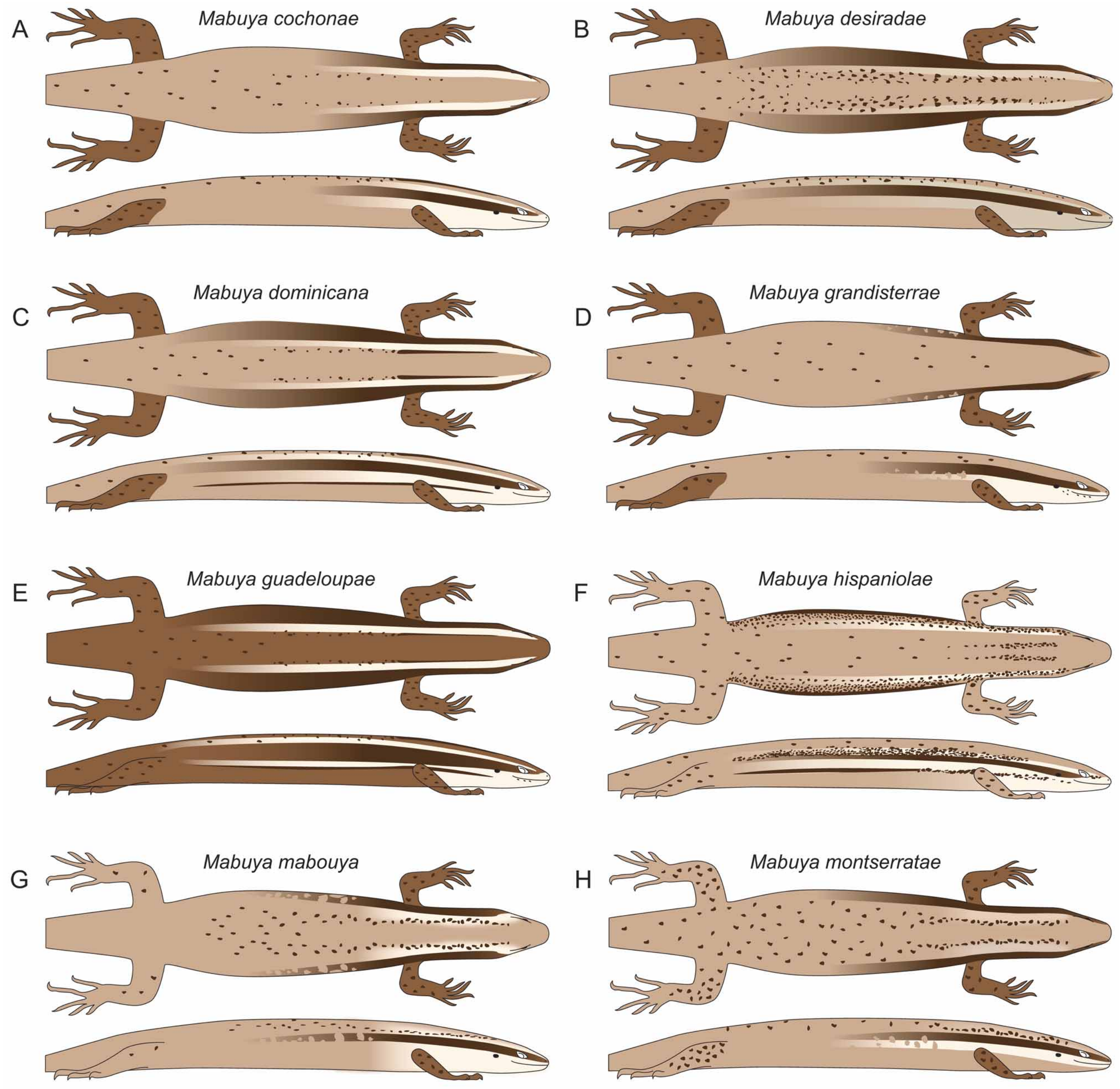

FIGURE 32. Representative patterns in species of the Genus *Mabuya* (top, dorsal view; bottom, side view). (A) *M. cochonae* **sp. nov.**; (B) *M. desiradae* **sp. nov.**; (C) *M. dominicana*; (D) *M. grandisterrae* **sp. nov.**; (E) *M. guadeloupae* **sp. nov.**; (F) *M. hispaniolae* **sp. nov.**; (G) *M. mabouya*; and (H) *M. montserratae* **sp. nov.**

Ecology and conservation. Little has been recorded of the ecological habits of this species. In his field notes, Albert Schwartz mentioned that the specimens were taken among sea grape trees (*Coccoloba uvifera*), under wood on the ground. No observations have been recorded on this species in the subsequent five decades. Apparently, the mongoose does not occur on Îlet à Cochons (Breuil 2009). This very small island is not protected and is occupied by humans and their domestic animals and pests, and therefore the survival of the species continues to be threatened.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Mabuya cochonae* **sp. nov.** to be Critically Endangered (CR A2ace). It faces a primary threat from introduced mammalian predators, including black rats, and secondary threat from habitat alteration. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, and efforts should be undertaken to remove all introduced mammalian predators from the island.

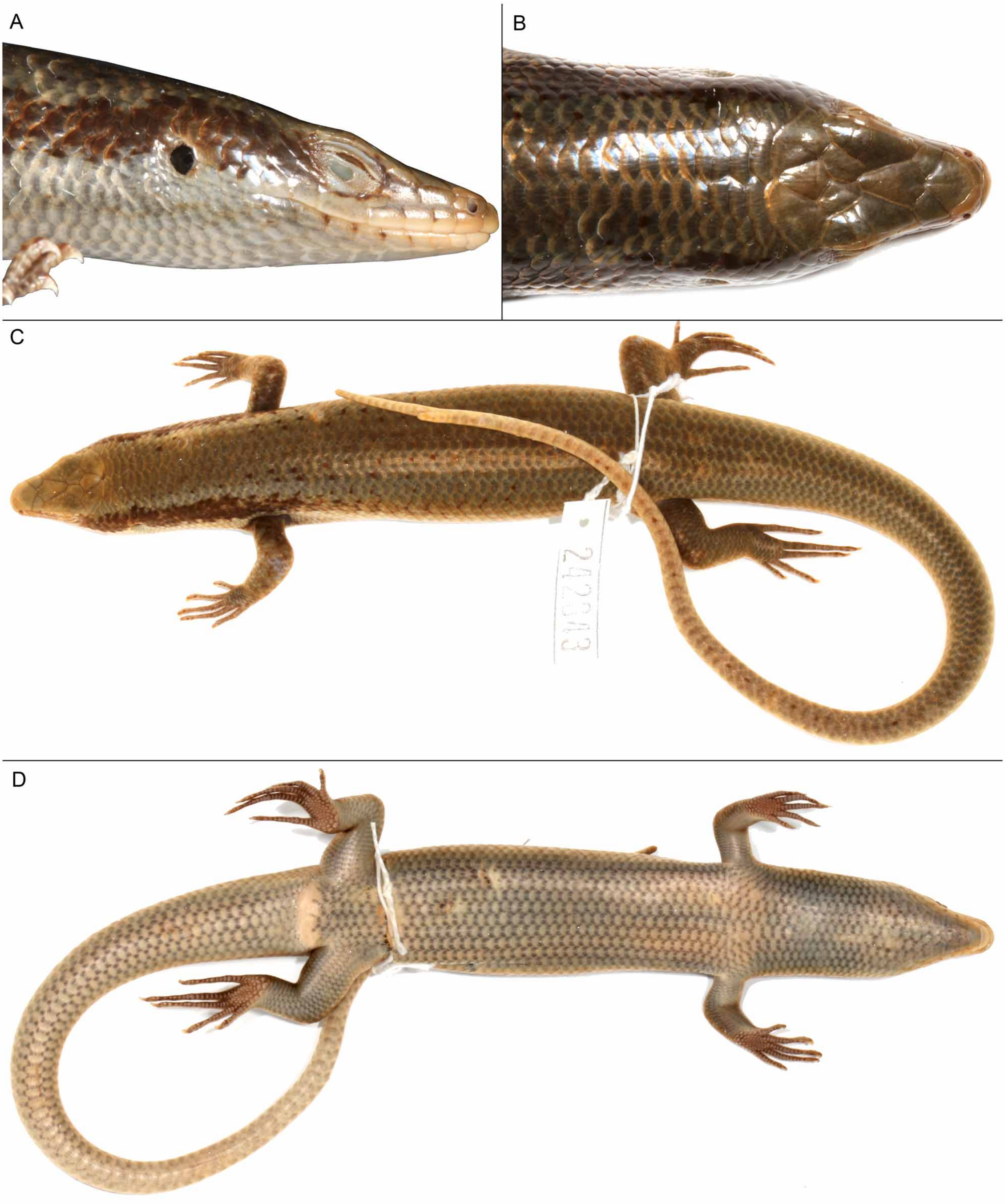

FIGURE 33. *Mabuya cochonae* **sp. nov.**, from Guadeloupe. (A–D) KU 242043, holotype, Îlet à Cochons, Basse-Terre.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*cochonae*) is a feminine genitive singular noun, referring to the distribution of the species on Îlet à Cochons.

Remarks. KU lists only Albert Schwartz as collector for all of the Schwartz skink material, but he was accompanied by Richard Thomas (Richard Thomas, personal communication). Finding that the skinks of Guadeloupe and surrounding islets form a complex of species is perhaps not surprising given the endemism in other groups of amphibians and reptiles from Guadeloupe. There are two endemic species of frogs on Basse-Terre (*Eleutherodactylus barlagnei* Lynch and *E. pinchoni* Schwartz) and a diversity of endemic reptiles, including some species known only from specific islets such as Petite Terre (*Anolis chrysops* Lazell), Île des Saintes (*Anolis terraealtae* Lazell, *Sphaerodactylus phyzacinus* Thomas, and *Alsophis sanctonum* Barbour), La Désirade (*Anolis desiradei* Lazell), and Marie-Galante (*Anolis ferreus* Cope, and *Capitellum mariagalantae* **sp. nov.**). However, no species previously has been found to be endemic to Îlet à Cochons, which is only a short distance (600 m) from the mainland. Despite that short distance and shallow water depths, *M. cochonae* **sp. nov.** is considerably different from nearby *M. grandisterrae* **sp. nov.**, including the holotype of the latter species which is from Pointe-a-Pitre (only 2–3 km from Îlet à Cochons). In considering paleogeography, geologic uplift or subsidence may also have had a bearing on past land connections, in addition to sea level changes. Given the widespread decimation of Caribbean skinks by the mongoose and other mammalian predators, it is also possible that *M. cochonae* **sp. nov.** once co-occurred with *M. grandisterrae* **sp. nov.** and (or) *M. guadeloupae* **sp. nov.**, but was extirpated, with Îlet à Cochons representing only a last haven or refuge.

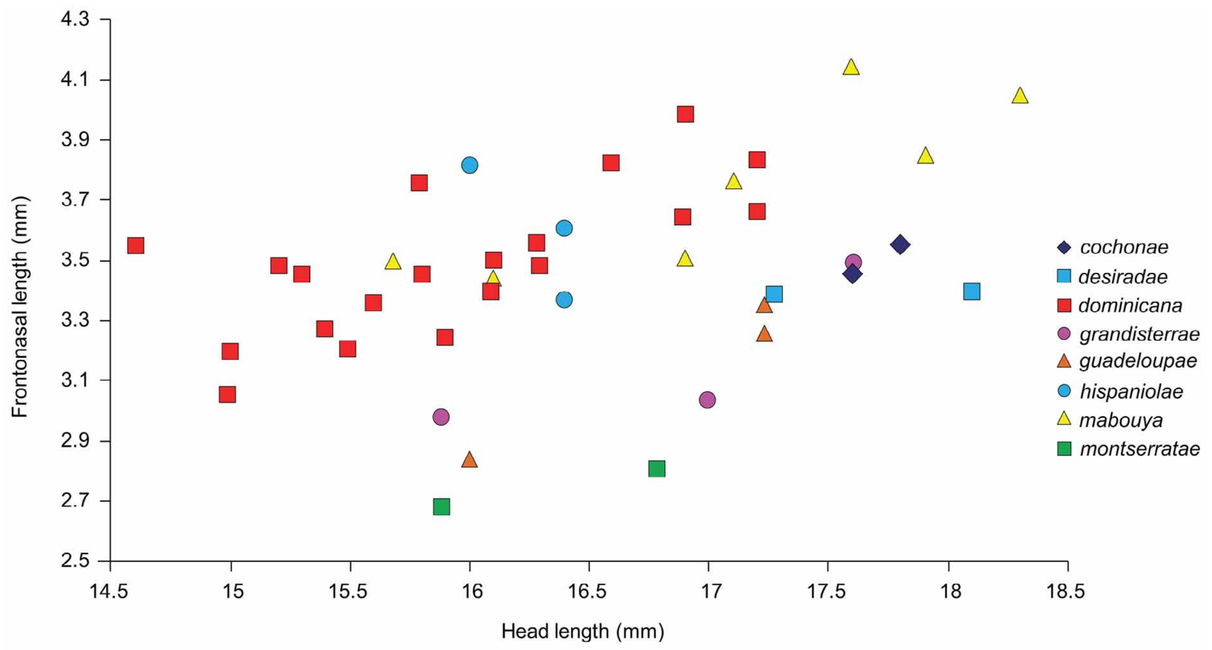

FIGURE 34. Graph of frontonasal length versus head length in the eight species of the Genus *Mabuya*.

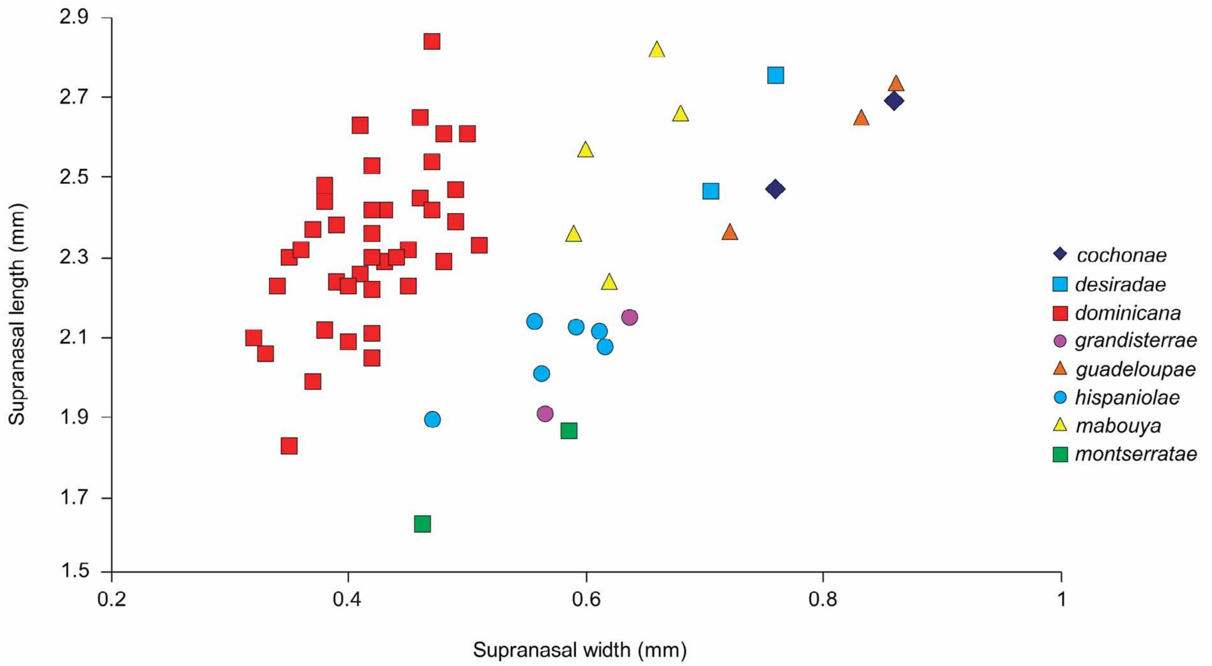

FIGURE 35. Graph of supranasal length versus supranasal width in the eight species of the Genus *Mabuya*. For *M. hispaniolae* **sp. nov.**, measurements are shown for the left and right scales of each of the three known adults.

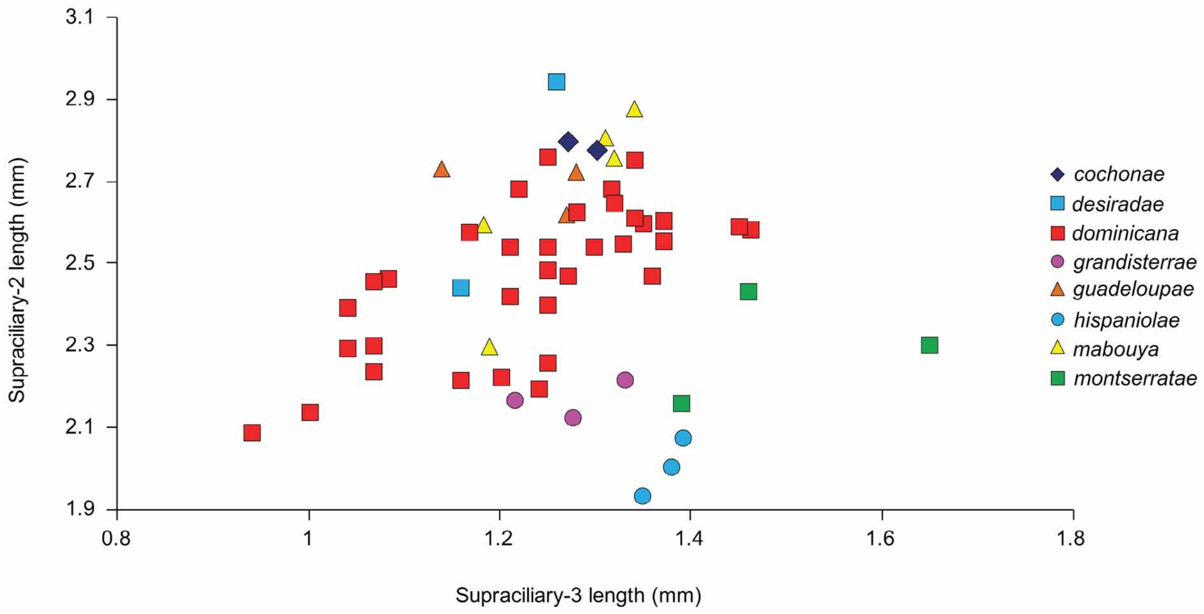

FIGURE 36. Graph of supraciliary-2 length versus supraciliary-3 length in the eight species of the Genus *Mabuya*.

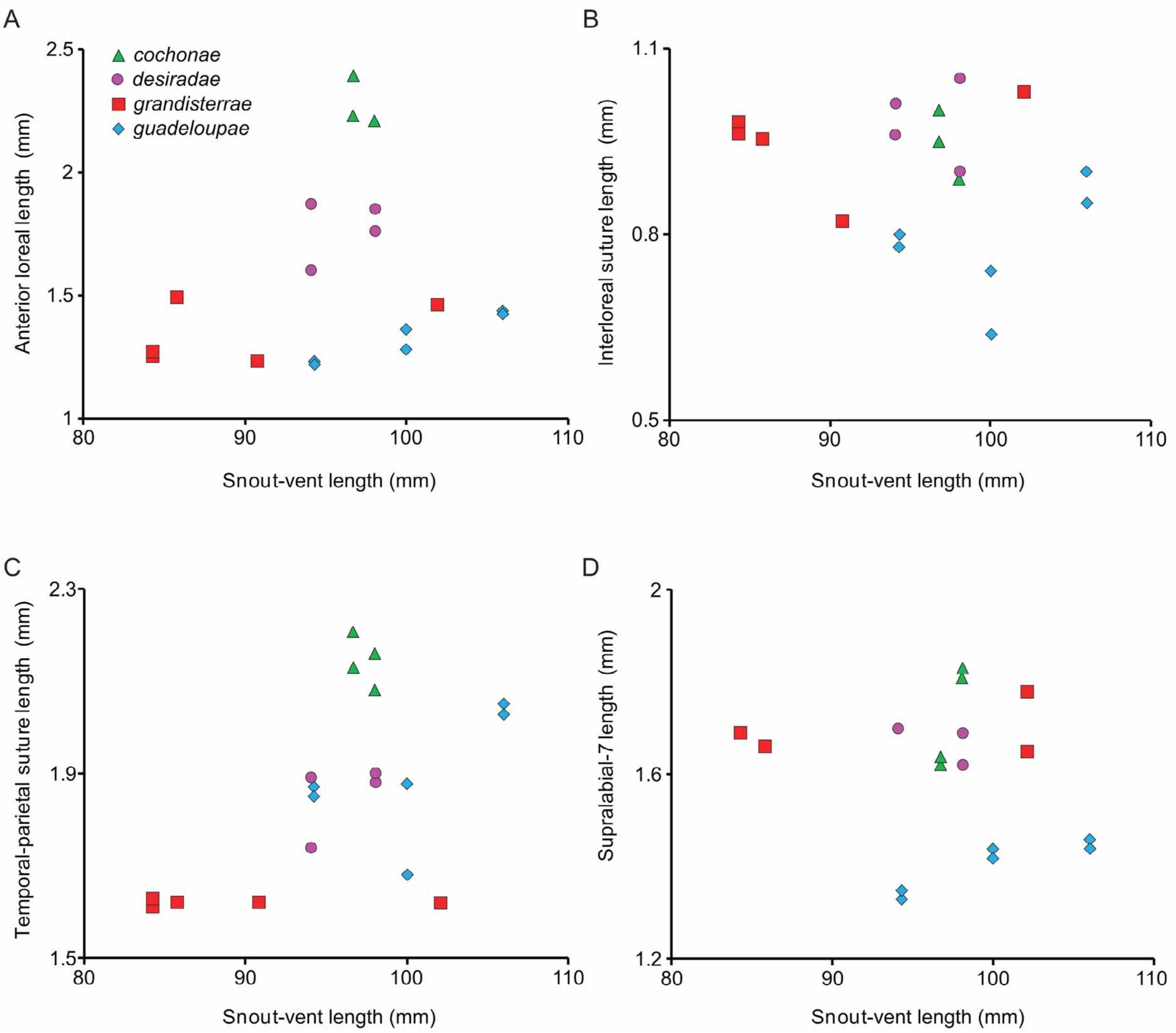

FIGURE 37. Graphs of four diagnostic characters of head scalation in the *Mabuya guadeloupae* **sp. nov.** species group (*M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, and *M. guadeloupae* **sp. nov.**). (A) length of anterior loreal; (B) interloreal suture length; (C) length of suture separating upper secondary temporal from parietal; and (D) length of supralabial-7. Measurements include those taken (if possible) from both sides of the head.

Mabuya desiradae sp. nov.
Désirade Skink
(Figs. 30B, 32B, 38)

Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:84 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. KU 242045, an adult male, collected by Albert Schwartz and Richard Thomas at Anse d'Echelle, La Désirade, Guadeloupe, on 28 February 1963.

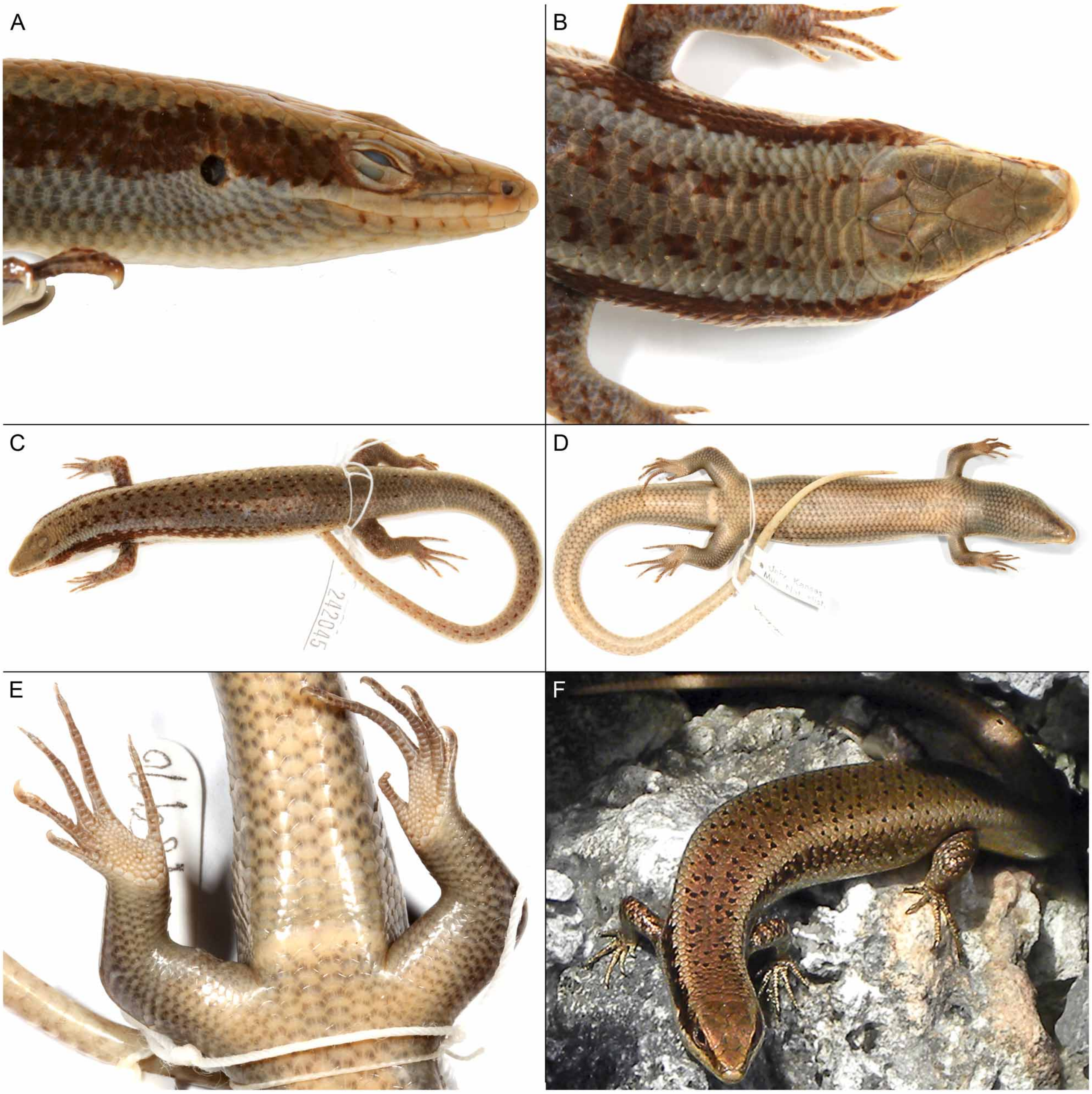

FIGURE 38. *Mabuya desiradae* **sp. nov.**, from Guadeloupe. (A–E) KU 242045, holotype, La Désirade. (F) uncataloged, Terre de Bas, Îles de la Petite Terre (live individual, photographed by O. Lorvelec).

Paratype (n = 1). Guadeloupe. KU 242046, an adult male, same locality and information as the holotype.

Diagnosis. *Mabuya desiradae* **sp. nov.** is characterized by (1) maximum SVL in males, 98.1 mm; (2) maximum SVL in females, not available; (3) snout width, 2.56–2.86% SVL; (4) head length, 18.5–19.0% SVL; (5) head width, 13.6% SVL; (6) ear length, 1.45–1.47% SVL; (7) toe-IV length, 10.2–10.4% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five (50%), six (50%); (13) nuchal rows, one; (14) dorsals, 62; (15) ventrals, 68–70; (16) dorsals + ventrals, 130–132; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 13–15; (19) toe-IV lamellae, 16–18; (20) finger-IV + toe-IV lamellae, 29–33; (21) supranasal contact, Y (50%), N (50%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, N; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. desiradae* **sp. nov.** and the other three species inhabiting Guadeloupe and its islets (*M. cochonae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, and *M. guadeloupae* **sp. nov.**), here placed in the *M. guadeloupae* **sp. nov.** species group, have a similarly-proportioned frontonasal scale that distinguishes them from other species in the genus (Fig. 34). Species in the *M. guadeloupae* **sp. nov.** species group have a longer frontonasal compared with *M. montserratae* **sp. nov.** (frontonasal length/head length 0.176–0.199 versus 0.165–0.168) and a shorter frontonasal compared with other species in the genus (0.176–0.199 versus 0.205–0.239 in *M. dominicana*, *M. hispaniolae* **sp. nov.**, and *M. mabouya*). In addition, *M. desiradae* **sp. nov.** differs from *M. dominicana* by having a shorter, wider supranasal scale (supranasal length/supranasal width 3.57–3.66 versus 4.57–6.57 in *M. dominicana*; Fig. 35), and in lacking a well-defined pale lateral stripe (present in 84% of *M. dominicana*). It is separated from *M. hispaniolae* **sp. nov.** by having a narrower snout (2.56–2.86% SVL versus 3.08–3.47% SVL) and in lacking well-defined lateral and pale dorsolateral stripes (such stripes are present and well-defined in *M. hispaniolae* **sp. nov.**). It is distinguished from *M. mabouya* by having more dorsals (62 versus 55–61) and a longer dark lateral stripe that extends two-thirds (versus one-third) of the body. It differs from *M. montserratae* **sp. nov.** by having a wider head (13.6% SVL versus 12.3–13.2% SVL) and a higher supraciliary-2/supraciliary-3 length ratio (2.11–2.34 versus 1.39–1.66 in *M. montserratae* **sp. nov.**; Fig. 36).

Mabuya desiradae **sp. nov.** differs from *M. cochonae* **sp. nov.** by having shorter anterior loreal scale (1.70–1.99% SVL versus 2.26–2.47% SVL; Fig. 37A), a shorter suture length between the upper secondary temporal and the parietal scale (1.85–2.01 versus 2.12–2.29% SVL; Fig. 37C), a larger ear (1.45–1.47% SVL versus 1.02–1.12% SVL), a larger separation of the prefrontal scales (1.74–1.75% SVL versus 0.89–1.16% SVL), longer dark lateral stripes and weakly defined pale dorsolateral stripes that extend two-thirds (versus one-third) of body, a dull silvery-gray (versus orange) venter in life, and a head that is more red in life. *Mabuya desiradae* **sp. nov.** differs from *M. grandisterrae* **sp. nov.** in having more dorsals (62 versus 54–61), more dorsals + ventrals (130–132 versus 116–128), a higher supraciliary-2/supraciliary-3 length ratio (2.11–2.34 versus 1.67–1.79 in *M. grandisterrae* **sp. nov.**; Fig. 36), and a longer dark lateral stripe that extends two-thirds (versus one-third) of body. *Mabuya desiradae* **sp. nov.** differs from *M. guadeloupae* **sp. nov.** in having a longer anterior loreal (1.70–1.99% SVL versus 1.28–1.36% SVL; Fig. 37A), a longer interloreal suture (0.92–1.07% SVL versus 0.64–0.85% SVL; Fig. 37B), and a longer supralabial-7 (1.65–1.81% SVL versus 1.36–1.44% SVL; Fig. 37D), and in lacking dark dorsolateral stripes (present on nape in *M. guadeloupae* **sp. nov.**), pale lateral stripes (present in *M. guadeloupae* **sp. nov.**) and well-defined dorsolateral stripes (weakly-defined versus well-defined in *M. guadeloupae* **sp. nov.**).

Description of holotype (Figs. 30B, 38A–E). An adult male in good state of preservation, without injuries and with an abdominal slit. SVL 94.1 mm; tail complete (length not measured); HL 17.4 mm; HW 12.8 mm; SW 2.41 mm; EL 1.38 mm; and toe-IV length 9.57 mm; ear opening small in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal (right side only). Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, first supraciliaries, and frontal. Frontal small and asymmetrical (roughly triangular), in contact with the first supraoculars. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreals rectangular and posterior loreals squarish with posterodorsal projection on latter. Two upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but usually smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven supralabials. Mental scale wider than long, posterior margin curved slightly toward tip of snout. Postmental scale and three pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second, third, and fourth pairs separated by smaller cycloid scales.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62 in a longitudinal row; ventrals similar to dorsals; 68 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 16 under toe-IV. Four preanals larger than adjacent ventral scales. Median subcaudal scales gradually increasing in size from base to tip of tail.

Pattern and coloration. Dorsal ground color dark greenish-brown with small dark brown spots, distributed on tail and limbs and in two dorsolateral bands on body. Limb coloration slightly darker than dorsum. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region to hindlimbs and breaking into a series of dark spots around midbody. Pale middorsal stripe absent. Pale dorsolateral stripes present, medium gray, extending from behind eye to midbody. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces brown. Color in life was recorded (Albert Schwartz field notes at KU) for holotype (and paratype) as "bronzy" dorsum with "heads distinctly more reddish and venter dull silverish-gray."

Variation. In coloration and scalation, the paratype resembled the holotype (Tables 4–5).

Distribution. The species is distributed on La Désirade island and Terre de Bas, Îles de la Petite Terre (Fig. 11B). Skinks from the latter island have been noted in the literature (Lorvelec *et al.* 2000, 2007; Breuil 2002), including photographs (Fig. 38F). Although we tentatively assign the skinks from Terre de Bas to this species, further study may show that they represent a separate species. As noted by Breuil (2002), an earlier literature reference to skinks on Les Saintes (Lazell 1973) is probably in error and refers to Îles de la Petite Terre, the two groups of islands being frequently confused because they both include a "Terre de Haut" and a "Terre de Bas."

Ecology and conservation. Little has been recorded of the ecological habits of this species. In his field notes, Albert Schwartz mentioned that the two known specimens were taken in rock crevices, among sea grape trees (*Coccoloba uvifera*). The skink observed on Terre de Bas, 19 April 1998 (Lorvelec *et al.* 2000) was found in a forest on sand, near a lagoon. Four additional individuals were observed in May, 2010 (O. Lorvelec, personal communication). These islets are occupied by humans and their domestic animals and pests, and therefore the survival of the species continues to be threatened. Population numbers of skinks on La Désirade and Terre de Bas have been described as "low" (Breuil 2009).

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Mabuya desiradae* **sp. nov.** as Critically Endangered (CR A2ace). It faces a primary threat from introduced mammalian predators, including black rats, and a secondary threat from habitat alteration. Studies are needed to determine the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, and efforts should be undertaken to remove all introduced mammalian predators from the islands where it occurs.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*desiradae*) is a feminine genitive singular noun, referring to the distribution of the species on La Désirade.

Remarks. KU lists only Albert Schwartz as collector for all of the Schwartz' skink material, but he was accompanied by Richard Thomas when the type and paratype were collected (Richard Thomas, personal communication). As mentioned for *Mabuya cochonae* **sp. nov.**, finding endemic skinks on the islets of Guadeloupe is not surprising given that they are already known to harbor endemic reptiles. There is an endemic anole (*Anolis desiradei* Lazell) and a subspecies of gecko (*Sphaerodactylus fantasticus hippomanes* Thomas) on La Désirade and an endemic anole (*Anolis chrysops* Lazell) and ameiva (*Ameiva major* Duméril & Bibron) known from Îles de la Petite Terre.

Mabuya dominicana Garman, 1887
Dominica Skink
(Figs. 30C, 32C, 39)

Mabuia dominicana Garman, 1887:52. Lectotype: MCZ R-6049 (paralectotypes, MCZ R-185619–20), collected by Samuel Walton Garman on Dominica, March, 1879.
Mabuya agilis—Günther, 1888:364 (part).
Mabuya dominicana—Barbour, 1914:321.
Mabuya dominicana—Barbour, 1930:105.
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouia—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:34 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002: 267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Material examined (n = 57). Dominica. MCZ R-6049 (lectotype; photographs); AMNH R135271, Paul G. Howes, no specific locality, 1929; BMNH 1964.1440, Roseau, 1964 (collector unknown); CAS 112317, B. Malkin, Salibia, 27–30 January 1968; KU 242015, Albert Schwartz, 2 miles west Melville Hall, St. Andrew, 8 March 1962; KU 242016–242018, Albert Schwartz, 0.5 miles west Rosseau, St. David, 23 February 1962; KU 242019, Albert Schwartz, 0.5 miles east Laborie, St. George, 2 April 1961; KU 242020–242026, Albert Schwartz, 1.5 miles north Portsmouth, St. John, 22 February 1962 and 12 March 1963; KU 242027–272028, Albert Schwartz, Clarke Hall Estate, 1.5 miles northeast Layou, St. Joseph, 12–14 March 1963; KU 242029–242034, Albert Schwartz, 1 mile north Morne Raquette, St. Joseph, 16–18 February and 4 March 1962; KU 242035, Albert Schwartz, Geneva, St. Patrick, 28 February 1962; KU 242036–242037, Albert Schwartz, 1 mile east Stowe, St. Patrick, 28 February 1962; KU 242038–242040, Albert Schwartz, Canefield Estate, St. Paul, 11 March 1963; KU 242041, Albert Schwartz, 2.5 miles southeast Layou, St. Paul, 26 March 1961; KU 242042, Albert Schwartz, 1 mile north Pont Casse, St. Paul, 22 March 1961; MCZ R-57814, James Lazell, Moore Park, St. Andrew, 23 June 1958; MCZ R-127759, James Lazell, Dubuc Grand Bay, 26 February 1966; MCZ R-127760, James Lazell, botanical garden, Roseau, 26 February 1966; MCZ R-157108, James Lazell, New Florida Estate, Morne Anglais, 8 June 1973; MCZ R-182281, “W. Lu,” Soufriere, St. John, 19 January 1998; MPM 23266–26267, 4.7 miles NNW Mahout, St. Paul, 1987 (collector unknown); UMMZ 83319, Chester Roys, no specific locality, 20 June 1937; UMMZ 83320–83322 and 239608–239614, Chester Roys, South Central Dominica, 23–26 June 1937; UMMZ 83323 and 239615–239616, Chester Roys, Top of Divide between Roseau and Grand Bay, Dominica, June 1937; USNM 160610–160611, Bredin-Archbold-Smithsonian Biological Survey of Dominica, Clarke Hall, Middle of Plantation, 18 October 1965.

Diagnosis. *Mabuya dominicana* is characterized by (1) maximum SVL in males, 92.3 mm; (2) maximum SVL in females, 101 mm; (3) snout width, 2.41–3.45% SVL; (4) head length, 16.4–20.9% SVL; (5) head width, 11.5–15.4% SVL; (6) ear length, 0.771–1.82% SVL; (7) toe-IV length, 8.91–13.4% SVL; (8) prefrontals, two; (9) supraoculars, three (60%), four (40%); (10) supraciliaries, three (2%), four (86%), five (11%), six (2%); (11) frontoparietals, two; (12) supralabial below the eye, five (70%), six (28%), seven (2%); (13) nuchal rows, one (98%), two (2%); (14) dorsals, 54–63; (15) ventrals, 63–73; (16) dorsals + ventrals, 118–136; (17) midbody scale rows, 27–32; (18) finger-IV lamellae, 12–16; (19) toe-IV lamellae, 15–19; (20) finger-IV + toe-IV lamellae, 27–34; (21) supranasal contact, Y (52%), N (48%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (59%), N (41%); (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, Y (14%; but only as a thin line on nape), N (86%); (27) dark lateral stripe, Y; (28) pale lateral stripe, Y (84%), N (16%); and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. dominicana* differs from all other species by having a longer, narrower supranasal scale (supranasal length/width 4.57–6.57 versus 3.13–4.28 in those other species; Fig. 35). It is also separated from *M. montserratae* **sp. nov.** and *M. hispaniolae* **sp. nov.** by having a higher supraciliary-2/ supraciliary-3 length ratio (1.77–2.30 versus 1.39–1.66 in those two species; Fig. 36). It differs from *M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, and *M. guadeloupae* **sp. nov.** by having a longer frontonasal (frontonasal length 20.5–23.1% head length versus 17.8–19.9% in other species; Fig. 34). It differs from *M. hispaniolae* **sp. nov.** by having a narrower snout (snout width 13.6–17.5% HL versus 17.4–18.0% in *M. hispaniolae* **sp. nov.**; Fig. 40). Except for *Mabuya guadeloupae* **sp. nov.**, *M. dominicana* has the best-developed stripes in the genus (Fig. 32). These include dark lateral and ventrolateral stripes, dorsolateral and pale lateral stripes (pale lateral stripes in 84% of specimens), and (occasionally) traces of narrow dark dorsolateral stripes on the nape (Fig. 32C). These stripes are evident in some fetuses (Fig. 39D), although *M. hispaniolae* **sp. nov.** has lateral dark and pale stripes that are nearly as well-developed.

Description of lectotype (Figs. 39A–C). The following is based on our examination of photographs. An adult (sex not determined) in moderate state of preservation, without injuries and with an abdominal slit. SVL, tail length (regenerated), HL, HW, SW, EL, and toe-IV length not measured; ear-opening average in size and round; toe length in the following order: I < II < V < III < IV.

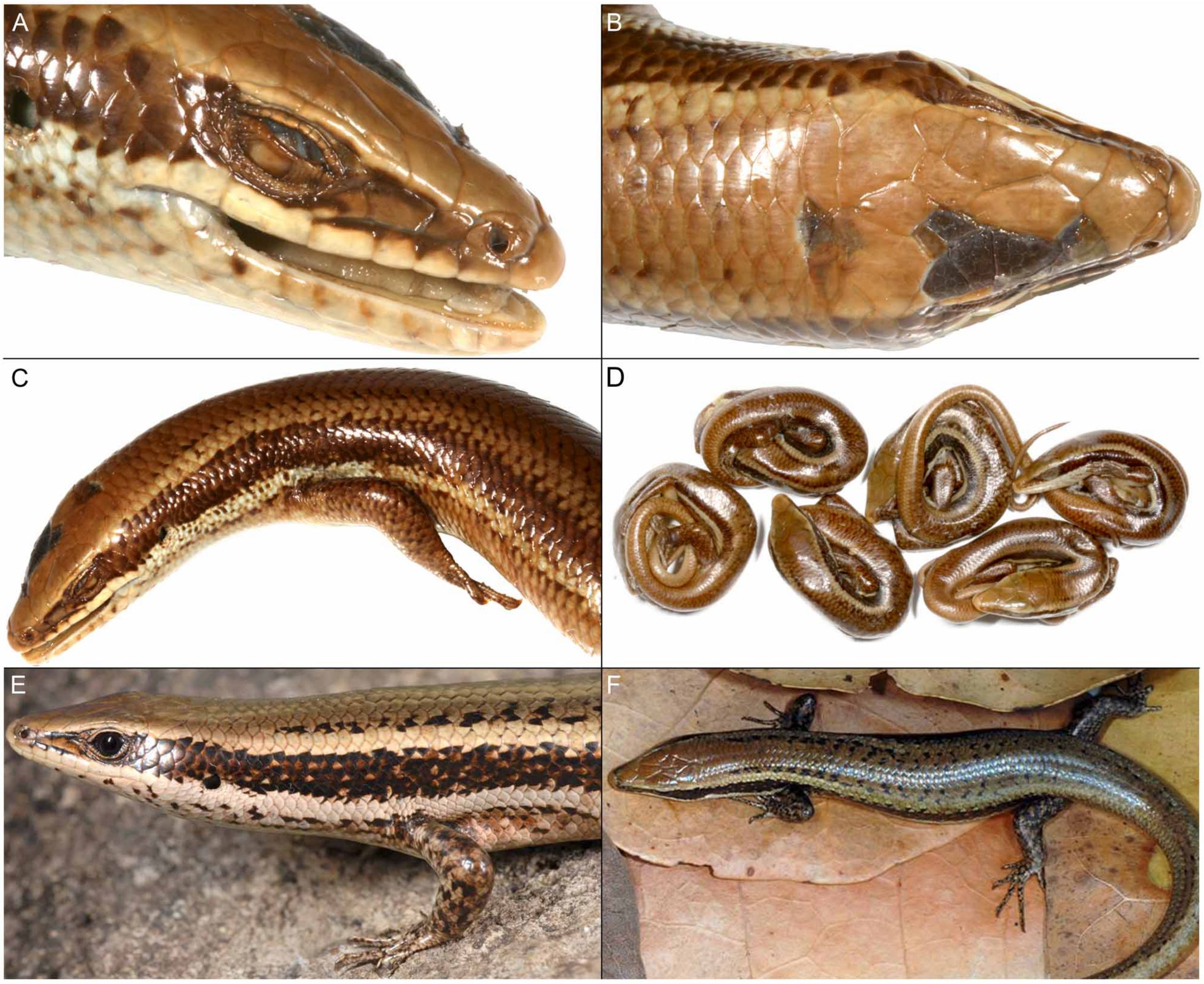

FIGURE 39. *Mabuya dominicana*, from Dominica. (A–C) MCZ R-6049, lectotype, Dominica (no specific locality). (D) fetuses of UMMZ 239613, "south-central Dominica." (E–F) uncataloged, Batali Beach (live individual, photographed by Robert Powell).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal squarish and posterior loreal rectangular with posterodorsal projection on latter. One upper and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 71 in a longitudinal row; midbody scale count not possible with photograph. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs and different on regenerated portion of tail. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 18 under toe-IV (finger lamellae not visible in photographs). Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on original portion of tail.

Pattern and coloration. Dorsal ground color medium brown with small dark brown spots, distributed uniformly on limbs (slightly darker ground color) and in two dorsolateral bands on body and tail. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region to hindlimbs. Pale middorsal stripe absent. Pale dorsolateral stripes present, pale brown, extending from behind eye onto tail. Pale lateral stripes present, whitish, extending from below ear to hindlimbs, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. Garman (1887) noted that the syntypes were brownish-olive (bronzed) in base coloration and that the pale bands were white.

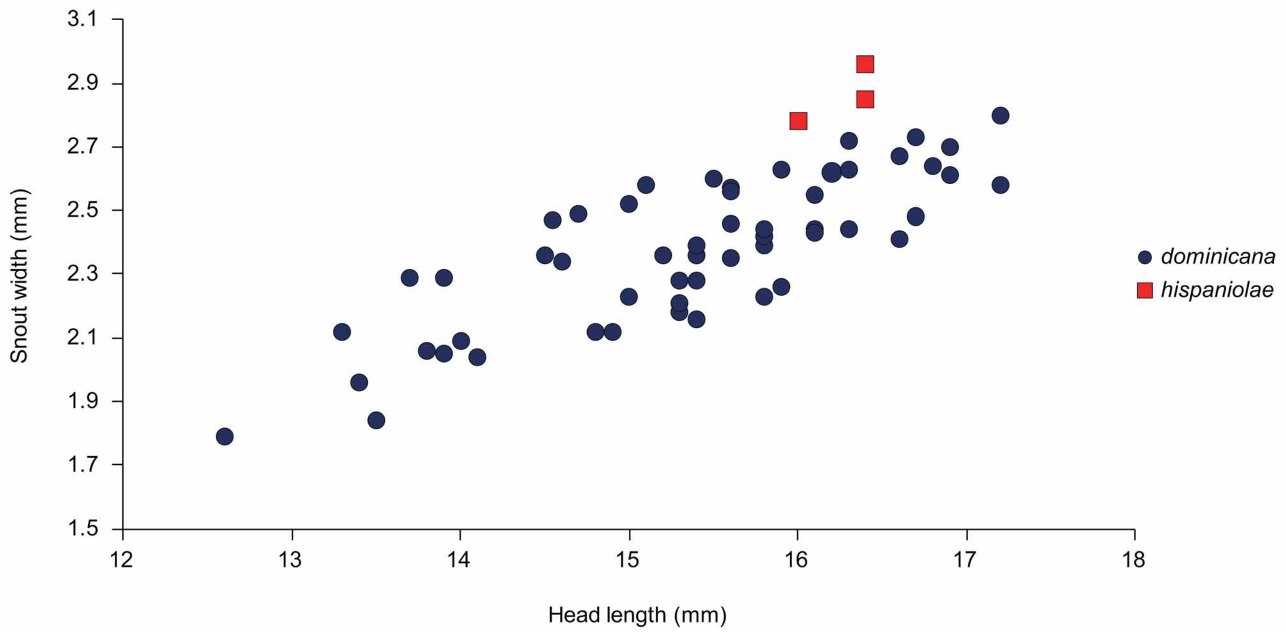

FIGURE 40. Graph of snout width versus head length in two species of the Genus *Mabuya*.

Variation. In coloration, most specimens resembled the lectotype (Table 5). Dorsal ground color was fairly constant (brown or brownish-green), and all specimens had dark dorsal spots arranged in two dorsolateral bands anterior to the forelimbs (although this band was much more distinct in some specimens than in others) and spread fairly uniformly across the dorsum posterior to the forelimbs. A distinct white pale lateral stripe bordered below by a dark line was present on some specimens.

Distribution. This species is found only on Dominica (Fig. 11F), where nearly all records come from coastal areas, although it may be found inland in higher elevations as well (Malhotra *et al.* 2007).

Ecology and conservation. Little is recorded for this species except that it is "widespread in coastal regions of the island" and under "corrugated iron roofs of agricultural sheds" in higher elevations (Malhotra *et al.* 2007). Based on the large number of specimens, many of which were collected in the last century, and sightings as recently as 2010 (R. Powell, personal communication), the species appears to be relatively common, related probably to the fact that the mongoose does not occur on Dominica.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Mabuya dominicana* as Vulnerable (VU D2). We consider the mongoose to be the primary threat for this species, despite its current absence from the island. An accidental (or not) introduction of the mongoose—which occurs on neighboring islands to the north and south—could be devastating and would likely result in rapid decline and extinction of the species within a short time, based on history (see Discussion). The black rat is a predator of small reptiles (Young 2008) and is on Dominica, and therefore there is a potential for a negative effect on this species as well (as may have occurred with *M. montserratae* **sp. nov.**; see below). Captive breeding now is warranted, for protection of the species in case it were to decline rapidly in the future.

Reproduction. Thirteen females (72.8–100.7 mm SVL) contained 1–6 (mean = 3.0) developing young. The dates of collection for those specimens were June 1937; 22–23 February, 1962; and 11–12 March, 1963. Somma and Brooks (1976) examined seven pregnant females of this species and concluded that litter size averaged 3.3, and that two young lizards at birth measured 29 and 30 mm SVL.

Etymology. The species name (*dominicana*) is a feminine singular noun, referring to the distribution of the species on the island of Dominica.

Remarks. Shortly after Garman (1887) described *Mabuya dominicana*, Günther (1888) reported on an additional collection of *Mabuya* from the island. Günther noted that his specimens showed a wider variation in some standard scale counts (ventrals and supranasal contact) than those of Garman and synonymized *M. dominicana* with what is here called *Brasiliscincus agilis* (a taxon that included several species at that time). Günther also went beyond the science and attacked Garman's reputation as well, alluding to a 19th century rivalry or feud. The specifics of the data are not of consequence here because the taxonomic context (species to be compared) is quite different now, and the conventional characters used by Garman (1887) to diagnose *M. dominicana* from close relatives (e.g., *M. mabouya*) are no longer useful. But Günther (1888) was not correct either, because he failed to see that *M. dominicana* differs considerably from *B. agilis*, and his low scale count (57 ventrals chin-to-vent) for two specimens of *M. dominicana* is considerably lower than the lowest we recorded (63) out of 58 specimens. We suspect it was a miscount, or anomaly. Later, Barbour (1914) also pointed to this error by Günther (1888), reinstated *M. dominicana* as a valid species, and devoted a full page to a quote from Günther, mainly to chastise him for his "invidious remarks" concerning Garman. Since Dunn (1936) synonymized *M. dominicana* (and many other taxa) into *M. mabouya*, it has not been recognized as a species until now.

***Mabuya grandisterrae* sp. nov.**

Grande-Terre Skink
(Figs. 30D, 32D, 41)

Eumeces mabouia—Duméril & Bibron, 1839:646 (part).
Mabouya cepedii—Gray, 1845:95 (part).
Mabuya mabouia—Barbour, 1914:320 (part).
Mabuya sp. indet.—Barbour, 1930:105.
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouia—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:38 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).

Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al*., 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:84 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. BMNH 1920.1.20.398, an adult female, collected at Pointe-à-Pitre, Grande-Terre, Guadeloupe, by "Vitrac" and donated to the BMNH by F. Lataste; entered into the BMNH registry on 20 January 1920 (and thus collected at some time before that date).

Paratypes (n = 4). Guadeloupe. USNM 11175, USNM 11249 and USNM 565045–46, May 1880, Guadeloupe, no specific locality (no collector information available).

Material not examined (n = 1). Guadeloupe. BMNH 1920.1.20.399 (paratopotype), same collecting data as holotype.

Diagnosis. *Mabuya grandisterrae* **sp. nov.** is characterized by (1) maximum SVL in males, 90.8 mm; (2) maximum SVL in females, 102.1 mm; (3) snout width, 2.34–3.44% SVL; (4) head length, 17.2–19.8% SVL; (5) head width, 12.5–13.9% SVL; (6) ear length, 1.26–2.08% SVL; (7) toe-IV length, 10.2–12.8% SVL; (8) prefrontals, two; (9) supraoculars, two (20%), three (80%); (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five (80%), six (20%); (13) nuchal rows, one; (14) dorsals, 54–61; (15) ventrals, 62–68; (16) dorsals + ventrals, 116–128; (17) midbody scale rows, 30–34; (18) finger-IV lamellae, 14–15; (19) toe-IV lamellae, 17–18; (20) finger-IV + toe-IV lamellae, 31–33; (21) supranasal contact, Y (80%), N (20%); (22) prefrontal contact, Y (20%), N (80%); (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, N; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. grandisterrae* **sp. nov.** and the other three species inhabiting Guadeloupe and its islets (*M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, and *M. guadeloupae* **sp. nov.**), here placed in the *M. guadeloupae* **sp. nov.** species group, have a similarly-proportioned frontonasal scale that distinguishes them from other species in the genus (Fig. 34). Species in the *M. guadeloupae* **sp. nov.** species group have a longer frontonasal compared with *M. montserratae* **sp. nov.** (frontonasal length/head length 0.176–0.199 versus 0.165–0.168) and a shorter frontonasal compared with other species in the genus (0.176–0.199 versus 0.205–0.239 in *M. dominicana, M. hispaniolae* **sp. nov.**, and *M. mabouya*). In addition, *M. grandisterrae* **sp. nov.** differs from *M. dominicana* by lacking pale dorsolateral stripes and a well-defined pale lateral stripe (such stripes are present in *M. dominicana*). It is separated from *M. hispaniolae* **sp. nov.** by lacking well-defined pale lateral stripes (present in *M. hispaniolae* **sp. nov.**).

Mabuya grandisterrae **sp. nov.** differs from *M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, and *M. guadeloupae* **sp. nov.** by having a lower supraciliary-2/supraciliary-3 length ratio (1.67–1.79 versus 2.06–2.40; Fig. 36). It differs from *M. cochonae* **sp. nov.** in having fewer ventrals (62–68 versus 70), a shorter anterior loreal scale (1.35–1.74% SVL versus 2.26–2.47% SVL; Fig. 37A), a shorter suture length between the upper secondary temporal and the parietal scale (1.59–1.93 versus 2.12–2.29% SVL; Fig. 37C), and a larger ear (1.26–2.08 versus 1.02–1.12% SVL). *Mabuya grandisterrae* **sp. nov.** differs from *M. desiradae* **sp. nov.** in having fewer dorsals (54–61 versus 62), fewer dorsals + ventrals (116–128 versus 130–132), and a shorter dark lateral stripe that extends one-third (versus two-thirds) of body. *Mabuya grandisterrae* **sp. nov.** differs from *M. guadeloupae* **sp. nov.** in having a wider head (12.5–13.9% SVL versus 11.6–12.0% SVL), a longer toe (toe-IV 10.2–12.8% SVL versus 8.77–9.72% SVL), a longer interloreal suture (0.90–1.16% SVL versus 0.64–0.85% SVL; Fig. 37B), a longer supralabial-7 (1.62–2.00% SVL versus 1.36–1.44% SVL; Fig. 37D), and absence of dark dorsolateral stripes and well-defined pale lateral and dorsolateral stripes (those stripes present and well-defined in *M. guadeloupae* **sp. nov.**).

Description of holotype (Figs. 30D, 41). An adult female in good state of preservation, although the irregular and asymmetrical head scalation suggests that it sustained a head injury at some point in its life. An abdominal slit is present. SVL 84.3 mm; tail complete (length not measured); HL 15.3 mm; HW 11.7 mm; SW 2.67 mm; EL and toe-IV length not measured; ear-opening moderate in size, round; toe length in the following order: I < V < II < III < IV.

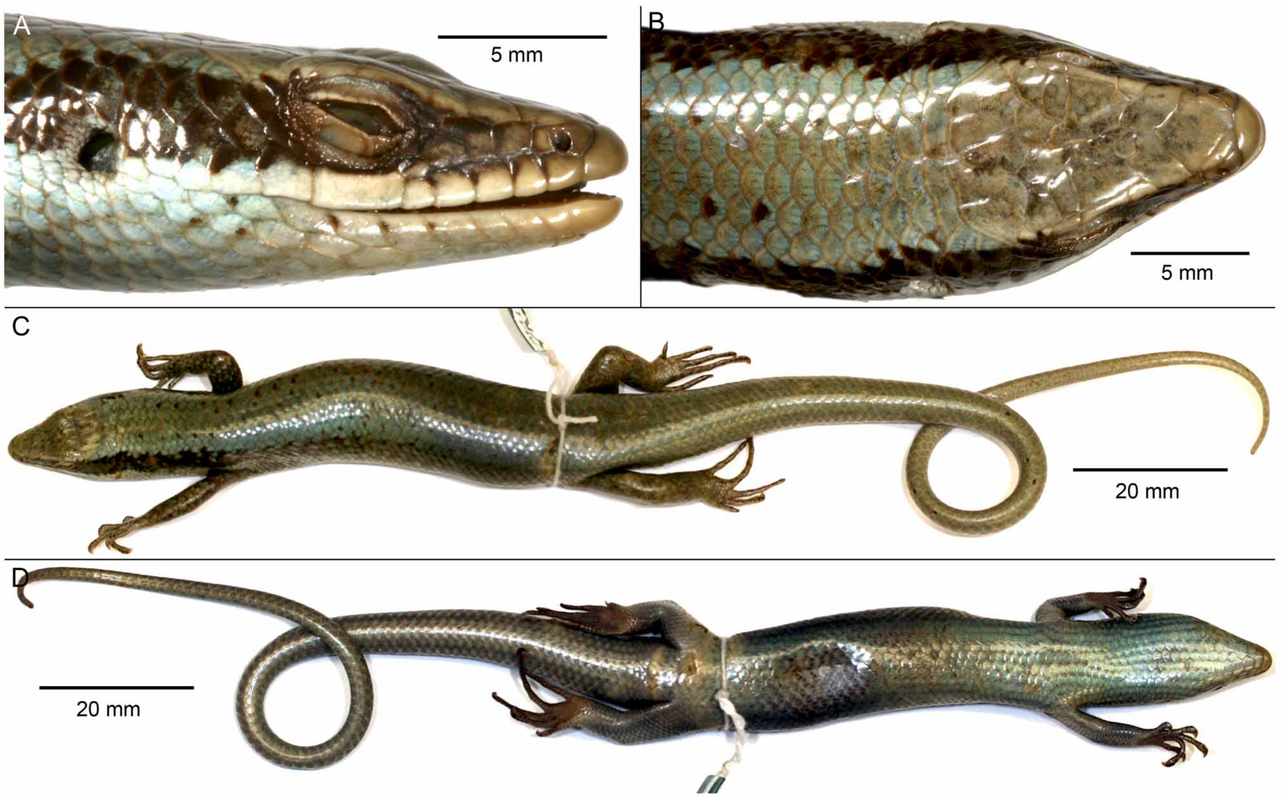

FIGURE 41. *Mabuya grandisterrae* **sp. nov.**, from Guadeloupe. (A–D) BMNH 1920.1.20.398, holotype, Pointe-à-Pitre, Basse-Terre.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal (right side only). Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, in contact medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal small and asymmetrical (roughly triangular), in contact with the first supraoculars. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posterodorsal projection on latter. Two upper preoculars and two lower preoculars. Eight supralabials on the right and seven on the left, the sixth on the right and the fifth on the left being the widest and forming the lower border of the eyelid. Four moderately enlarged scales behind eye (five on the left) comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials (seven on the left). Mental scale wider than long, posterior margin curved slightly toward tip of snout. Postmental scale and two pairs of adjoining chin shields (plus one additional right chin shield) in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 56 in a longitudinal row; ventrals similar to dorsals; 64 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 15 under finger-IV and 18 under toe-IV. Preanal scales similar to ventrals. Median subcaudal scales gradually increasing in size from base to tip of tail.

Pattern and coloration. Dorsal ground color medium greenish-gray with small dark brown spots, uniformly distributed on body and tail. Limbs greenish-gray with dark brown mottling on dorsal surfaces. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown with pale bluish-gray spots posterior to hindlimbs, extending from loreal region to first third of body. Pale middorsal stripe, pale dorsolateral stripe, and pale lateral stripe absent. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information on color in life is available for the holotype, although its pale bluish-green hue suggests that it was tan.

Variation. In coloration and scalation, the paratypes resembled the holotype, although the pattern was much faded in the four USNM specimens, which appeared uniformly brown, apparently from formalin fixation (Tables 4–5). The pattern of the holotype is in much better condition; the bluish-green hue is probably a reaction to preservative.

Distribution. The species is distributed on Guadeloupe (1,628 km^2), where the only known locality is the city of Pointe-à-Pitre, Grande-Terre (Fig. 11B). No specific locality data are associated with the USNM paratypic specimens.

Ecology and conservation. No ecological information exists for this species. It has not been observed in about a century, likely because of predation by the introduced mongoose or other mammalian predators. However, Guadeloupe is a large island, and there are small, fringing islets that might provide a mongoose-free haven for this species.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Mabuya grandisterrae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*grandisterrae*) is a feminine genitive singular noun, referring to the distribution of the species on Grand-Terre, Guadeloupe.

Remarks. Of the nine known specimens of *Mabuya* from the main islands of Guadeloupe (Grande-Terre and Basse-Terre), only the holotype and associated paratype (BMNH 1920.1.20.398–388) of this species, *M. grandisterrae* **sp. nov.**, have a specific locality. The three FMNH specimens are quite clearly a different species, described below (*M. guadeloupae* **sp. nov.**). It is possible that both species were broadly sympatric on both islands. However, given that they are similar in body size, and therefore would have competed with one another, we think it is more likely that *M. grandisterrae* **sp. nov.** evolved on the drier island, Grande-Terre (because two specimens are from that island), and the other species (*M. guadeloupae* **sp. nov.**) evolved on the wetter island, Basse-Terre. The coloration of the two species could be viewed as supporting that assumption: *M. guadeloupae* **sp. nov.** appears to be a darker species than *M. grandisterrae* **sp. nov.**, a coloration trend often seen in reptiles, where areas with higher rainfall often have more darkly-colored species.

***Mabuya guadeloupae* sp. nov.**
Guadeloupe Skink
(Figs. 31A, 32E, 42)

Eumeces mabouia—Duméril & Bibron, 1839:646 (part).
Mabouya cepedii—Gray, 1845:95 (part).
Mabuya mabouia—Barbour, 1914:321 (part).
Mabuya sp. indet.—Barbour, 1930:105.
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouia—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:38 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).

Mabuya bistriata—Malhotra & Thorpe, 1999:84 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. FMNH 213, an adult female, "Guadeloupe" (no specific locality, but assumed to be Basse-Terre; see Remarks), collected by Charles B. Cory in ca. 1892.

Paratypes (n = 2). Guadeloupe. FMNH 212, an adult female with same data as holotype; FMNH 214, an adult male, "Guadeloupe" (no specific locality), collected by W. W. Brown, Jr, in 1892.

Diagnosis. *Mabuya guadeloupae* **sp. nov.** is characterized by (1) maximum SVL in males, 94.3 mm; (2) maximum SVL in females, 106 mm; (3) snout width, 2.63–2.99% SVL; (4) head length, 16.4–17.3% SVL; (5) head width, 11.6–12.0% SVL; (6) ear length, 1.28–1.82% SVL; (7) toe-IV length, 8.77–9.72% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, one; (14) dorsals, 60–63; (15) ventrals, 67–70; (16) dorsals + ventrals, 128–133; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 14; (19) toe-IV lamellae, 18–21; (20) finger-IV + toe-IV lamellae, 32–35; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y (short, a thin line on nape); (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. guadeloupae* **sp. nov.** and the other three species inhabiting Guadeloupe and its islets (*M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, and *M. grandisterrae* **sp. nov.**), here placed in the *M. guadeloupae* **sp. nov.** species group, have a similarly-proportioned frontonasal scale that distinguishes them from other species in the genus (Fig. 34). Species in the *M. guadeloupae* **sp. nov.** species group have a longer frontonasal compared with *M. montserratae* **sp. nov.** (frontonasal length/head length 0.176–0.199 versus 0.165–0.168) and a shorter frontonasal compared with other species in the genus (0.176–0.199 versus 0.205–0.239 in *M. dominicana*, *M. hispaniolae* **sp. nov.**, and *M. mabouya*). In addition, *M. guadeloupae* **sp. nov.** differs from *M. dominicana* by having a shorter, wider supranasal scale (supranasal length/supranasal width 3.17–3.29 versus 4.57–6.57 in *M. dominicana*; Fig. 35). It differs from *M. hispaniolae* **sp. nov.** and *M. montserratae* **sp. nov.** in having a longer supraciliary-2 (supraciliary-2/supraciliary-3 length ratio 2.06–2.40 versus 1.39–1.66; Fig. 36). It differs from *M. mabouya* in having a narrower head (11.6–12.0% SVL versus 12.1–14.9% SVL), shorter toe (toe-IV length 8.77–9.72% SVL versus 10.2–12.5% SVL), dark dorsolateral and pale lateral stripes (absent in *M. mabouya*), and well-defined dorsolateral stripes (weakly-defined in *M. mabouya*).

Mabuya guadeloupae **sp. nov.** differs from *M. cochonae* **sp. nov.** in having a shorter head (16.4–17.3% SVL versus 18.7–19.1% SVL), a narrower head (11.6–12.0% SVL versus 12.8–13.1% SVL), a larger ear (ear length 1.28–1.82% SVL versus 1.02–1.12% SVL), a shorter toe (toe-IV length 8.77–9.72% SVL versus 11.1–11.6% SVL), more digital lamellae (finger-IV + toe-IV lamellae 32–35 versus 29–31), lack (versus presence) of supranasal contact, a shorter anterior loreal scale (1.28–1.36% SVL versus 2.26–2.47% SVL; Fig. 37A), a shorter interloreal suture (0.64–0.85% SVL versus 0.91–1.03% SVL; Fig. 37B), a shorter suture length between the upper secondary temporal and the parietal scale (1.68–1.98% SVL versus 2.12–2.29% SVL; Fig. 37C), a shorter supralabial-7 (1.36–1.44% SVL versus 1.68–1.87% SVL; Fig. 37D), and a pattern consisting of dark dorsolateral stripes and well-defined pale lateral and dorsolateral stripes (versus no dark dorsolateral stripes or well-defined pale lateral stripes). *Mabuya guadeloupae* **sp. nov.** differs from *M. desiradae* **sp. nov.** in having a shorter head (16.4–17.3% SVL versus 18.5–19.0% SVL), a narrower head (11.6–12.0% SVL versus 13.6% SVL), a shorter toe (toe-IV length 8.77–9.72% SVL versus 10.2–10.4% SVL), a shorter anterior loreal scale (1.28–1.36% SVL versus 1.70–1.99% SVL; Fig. 37A), a shorter interloreal suture (0.64–0.85% SVL versus 0.92–1.07% SVL; Fig. 37B), a shorter supralabial–7 scale (1.36–1.44% SVL versus 1.65–1.81% SVL; Fig. 37D), and a pattern consisting of dark dorsolateral stripes and well-defined pale lateral and dorsolateral stripes (versus no well-defined dark or pale dorsolateral stripes or pale lateral stripes in *M. desiradae* **sp. nov.**, only weakly defined pale dorsolateral stripes). *Mabuya guadeloupae* **sp. nov.** differs from *M. grandisterrae* **sp. nov.** in having a narrower head (11.6–12.0% SVL versus 12.5–13.9% SVL), a shorter toe (toe-IV length 8.77–9.72% SVL versus 10.2–12.8% SVL), a higher supraciliary-2/supraciliary-3 length ratio (2.06–2.40 versus 1.67–1.79; Fig. 36), a shorter interloreal suture (0.64–0.85% SVL versus 0.90–1.16% SVL; Fig. 37B), a shorter supralabial-7 scale (1.36–1.44% SVL versus 1.62–2.00% SVL; Fig. 37D), and a pattern consisting of dark dorsolateral stripes and well-defined pale lateral and dorsolateral stripes (versus no well-defined dark or pale dorsolateral stripes or pale lateral stripes in *M. grandisterrae* **sp. nov.**).

Description of holotype (Figs. 31A, 42). An adult female in poor state of preservation, without injuries and with an abdominal slit. SVL 100 mm; tail length 25.9 mm (broken); HL 17.0 mm; HW 11.6 mm; SW 2.63 mm; EL 1.45 mm; and toe-IV length 8.84 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

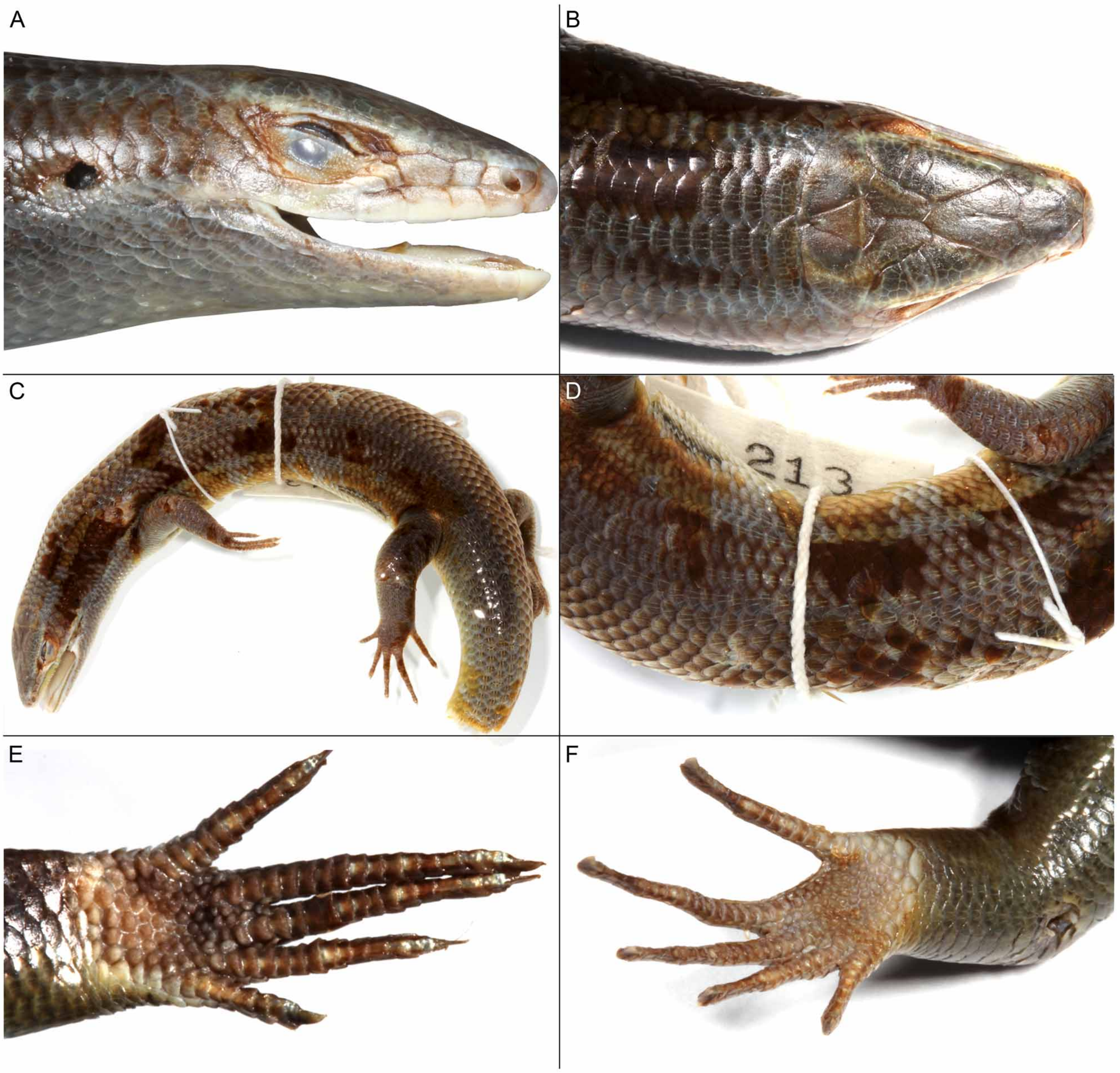

FIGURE 42. *Mabuya guadeloupae* **sp. nov.**, from Guadeloupe. (A–F) FMNH 213, holotype, no specific locality within Guadeloupe. The external, pigmented, portion of most scales is missing because of poor preservation.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal octagonal, in contact with the first supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal squarish and posterior loreal rectangular with posteromedial projection on latter. Three upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials (nine on the left). Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 63 in a longitudinal row; ventrals similar to dorsals; 70 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 18 under toe-IV. Fingers and toes clawed. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Stripe lengths and widths mostly could not be determined due to the preservation status of the specimen. Dorsal ground color dark brown with small dark brown spots. Dark dorsolateral stripes (a thin line on nape) and dark lateral stripes present, darker brown than ground color; the dark lateral stripes extend to the groin. Pale middorsal stripe present, brown. Pale dorsolateral stripes present, whitish. Pale lateral stripes present, whitish, extending from behind the ear. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available for color in life of the holotype.

Variation. In coloration and scalation, the paratypes resembled the holotype (Tables 4–5). All appear to have been darkly colored in life, although the condition of preservation is poor (most scales have fallen off).

Distribution. The species is distributed on Guadeloupe (1,628 km^2), with no specific locality. However, it is assumed here (see Remarks) that the species was collected on Basse-Terre, and that is probably the only island where it was distributed (Fig. 11B).

Ecology and conservation. No ecological information exists for this species. It has not been observed in about a century, likely because of predation by the introduced mongoose or other mammalian predators. However, Guadeloupe is a large island, and there are small, fringing islets that might provide a mongoose-free haven for this species.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Mabuya guadeloupae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*guadeloupae*) is a feminine genitive singular noun, referring to the distribution of the species on Guadeloupe. In the past, the name "Guadeloupe" was used synonymously with Basse-Terre, where the type material was probably collected and the island where the species is thought to be endemic.

Remarks. See the Remarks for the previous species (*Mabuya grandisterrae* **sp. nov.**) concerning the presumed distributions of *M. guadeloupae* **sp. nov.** and *M. grandisterrae* **sp. nov.** Although the locality information for FMNH 212–214 only records "Guadeloupe," and no additional notes (non-electronic) were located for those specimens, we found evidence that they were taken on Basse-Terre and not on Grande-Terre. The collector, Charles B. Cory, published a catalogue of birds (Cory 1892) at about the same time, and in it he refers to the western half of Guadeloupe as "Guadeloupe," not "Basse-Terre," and the eastern half as Grande-Terre. Also the islands are labeled as such on his map at the end of the book, and "Guadeloupe island" is written on original labels of birds that he collected, now in the FMNH (John Bates, personal communication). This all suggests that the type-locality for *M. guadeloupae* **sp. nov.** is the island of Basse-Terre. It was not unusual for names of islands in the West Indies to be used differently in earlier centuries (Hedges 2011). In this case, the island of Basse-Terre was initially the most populated and had the major port of entry to the country (the city of Basse-Terre), hence it took the name "Guadeloupe." Eventually, Pointe-à-Pitre on Grande-Terre increased in size, and today it is much larger than the capital city of Basse-Terre. It is most likely that the two species were allopatric on the separate (but nearly connected) islands of Basse-Terre (*M. guadeloupae* **sp. nov.**) and Grande-Terre (*M. grandisterrae* **sp. nov.**).

Mabuya hispaniolae sp. nov.

Hispaniolan Two-lined Skink
(Figs. 31B, 32F, 43)

Mabuya mabouya sloanii—Cochran, 1941:305 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:24 (part).
Mabuya mabouya sloanei—Henderson & Schwartz, 1984:25 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. UMMZ 83305, an adult male, collected 7 May 1937 at the Palace Hotel in Ciudad Trujillo (= Santo Domingo), Dominican Republic, by Chester Roys.

Paratypes (n = 7). Dominican Republic. UMMZ 239592–98 (paratopotypes), same collecting data as holotype (UMMZ 239593–97 are fetuses from UMMZ 239592).

Diagnosis. *Mabuya hispaniolae* **sp. nov.** is characterized by (1) maximum SVL in males, 86.6 mm; (2) maximum SVL in females, 92.6 mm; (3) snout width, 3.08–3.47% SVL; (4) head length, 17.7–19.2% SVL; (5) head width, 11.6–14.0% SVL; (6) ear length, 1.11–1.46% SVL; (7) toe-IV length, 10.7–11.1% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, four (75%), five (25%); (11) frontoparietals, two; (12) supralabial below the eye, five (50%), six (50%); (13) nuchal rows, one; (14) dorsals, 54–62; (15) ventrals, 67–76; (16) dorsals + ventrals, 123–138; (17) midbody scale rows, 30–32; (18) finger-IV lamellae, 13–14; (19) toe-IV lamellae, 16–19; (20) finger-IV + toe-IV lamellae, 30–33; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. hispaniolae* **sp. nov.** is separated from *M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, *M. guadeloupae* **sp. nov.** and *M. montserratae* **sp. nov.** by having a longer frontonasal scale (frontonasal length 20.5–23.9% head length versus 16.5–19.9% in those other five species; Fig. 34). It is distinguished from *M. dominicana*, *M. grandisterrae* **sp. nov.**, *M. guadeloupae* **sp. nov.**, and *M. mabouya* by having a longer supraciliary-2 scale (supraciliary-2/supraciliary-3 length ratio 1.43–1.49 versus 1.67–2.40 in those other species; Fig. 36). *Mabuya hispaniolae* **sp. nov.** additionally differs from *M. dominicana* by having a wider supranasal scale (supranasal length/width 3.41–4.15 versus 4.57–6.57 in *M. dominicana*; Fig. 35). It also has a wider snout than *M. dominicana* (snout width 17.4–18.0% HL versus 13.6–17.5% in *M. dominicana*; Fig. 40) and a less dorsoventrally compressed head (not measured). *Mabuya hispaniolae* **sp. nov.** (visible in the holotype) differs from *M. mabouya* by having a pale lateral stripe bordered below by a narrow dark line (versus no border in *M. mabouya*). From *M. montserratae* **sp. nov.** it is also distinguished by having a smaller ear (ear length 1.11–1.46% SVL versus 1.49–1.55% in *M. montserratae* **sp. nov.**). *Mabuya hispaniolae* **sp. nov.** also tends to have fewer midbody scale rows than *M. montserratae* **sp. nov.**, 30 (six individuals) and 32 (two) versus 32 (four individuals) and 34 (four), and the fetuses of *M. montserratae* **sp. nov.** are spotted and lack dark dorsolateral stripes whereas the fetuses of *M. hispaniolae* **sp. nov.** have dark dorsolateral stripes, at least anteriorly.

Description of holotype (Figs. 31B, 43A–C). An adult male in good state of preservation, without injuries and with an abdominal slit. SVL 85.4 mm; tail length not measured (regenerated); HL 16.4 mm; HW 11.1 mm; SW 2.96 mm; EL 1.25 mm; and toe-IV length 9.45 mm; ear-opening average in size and round; toe length in the following order: I < II < V < III < IV.

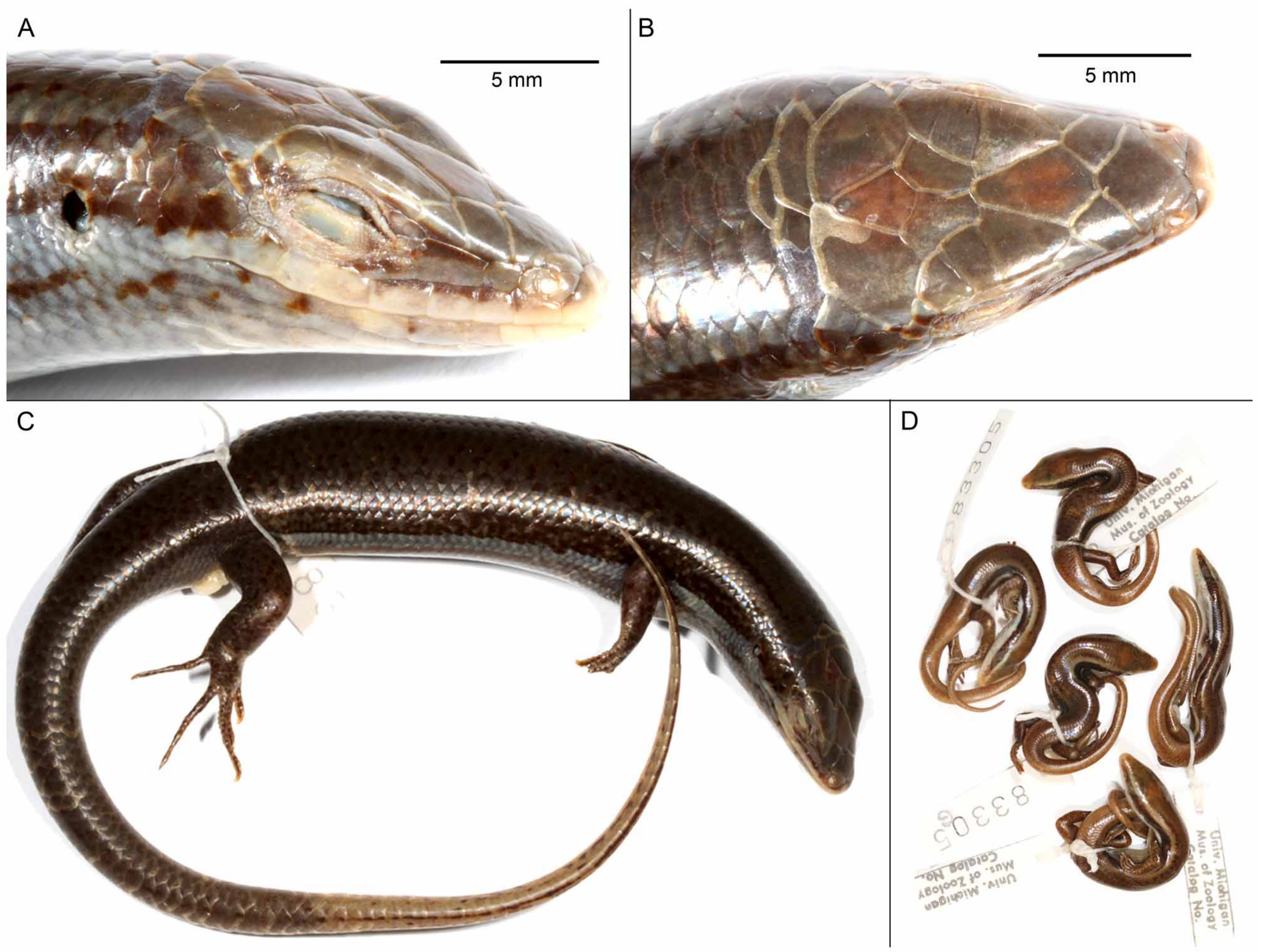

FIGURE 43. *Mabuya hispaniolae* **sp. nov.**, from Hispaniola. (A–C) UMMZ 83305, holotype, from Santo Domingo, Dominican Republic. (D) fetuses of UMMZ 239592.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the first supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal squarish and posterior loreal rectangular with posterodorsal projection on latter. Three upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 56 in a longitudinal row; ventrals similar to dorsals; 69 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. One enlarged dorsal scale row and one enlarged ventral scale row on regenerated tail with rows similar to ventrals on each side. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 18 under toe-IV. Preanal scales similar to ventrals.

Pattern and coloration. Dorsal ground color medium gray-brown with small-to-medium dark brown spots, distributed on body (forming two dorsolateral dark bands), tail, and limbs. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region to last third of body, where they transition to dark spots, while keeping a narrow fringe of dark-edged scales above the pale venter. Pale middorsal stripe absent. Pale dorsolateral stripes present, pale gray, extending from behind eye to last third of body. Pale lateral stripes present, whitish, extending from below eye to last third of body, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available for color in life of the holotype.

Variation. Aside from minor variation as shown in the tables, the other specimens agreed with the holotype (Tables 3–5). The chin scale configuration was noted in one of the three adults (UMMZ 239598): the postmental scale and two pairs of adjoining chin shields are in contact with anterior infralabials; the first pair of chin shields is in contact medially; the second and third pairs are separated by smaller cycloid scales. The five fetuses showed strong banding as is seen in the holotype male, but the mother and the other male both have a faded, reddish-brown appearance often seen in old, formalin-fixed specimens.

Distribution. The species is distributed on Hispaniola, where it is known only from the capital city of Santo Domingo, Dominican Republic (Fig. 9B).

Ecology and conservation. No ecological data are recorded for any of the specimens except that they were collected at the "Palace Hotel," which suggests an artificial, urban habitat such as a park or garden. Historical records (newspaper accounts) indicate that the Hotel "Palace" was located in the colonial part of the city, on street Emiliano Tejera, between streets Arzobispo Meriño and Isabel La Católica, and was demolished in 1944 (Blanca Delgado and Sixto Inchaustegui, personal communication). That location was only about two blocks from the Rio Ozama, the major river at Santo Domingo. No large tracts of forest are in that area today, but there are small patches of trees in the colonial area, including near the river, and there may have been more trees 74 years ago. Because populations and species of mabuyine skinks are rare or possibly extinct on essentially all islands where the mongoose has been introduced, and because this species has not been seen since 1937, it may be extinct. Mongooses are not usually encountered in urban settings in the West Indies, and therefore a city park or hotel garden (e.g., type-locality) may have provided a temporary safe haven for this species, being decimated elsewhere (temporary, because this species of skink apparently no longer occurs in the city). It is unclear why mongooses might avoid urban areas, but the presence of dogs—which can kill a mongoose—may be a factor (Byron Wilson, personal communication).

The FAO (2005) lists total forest area of Haiti as 4.0% and Dominican Republic as 28.4%, but these numbers are inflated because the FAO definition of total forest includes areas with up to 90% of the trees missing (10% canopy). Primary forest area values are not listed by FAO for these countries, but where they are listed elsewhere, they average 10–20% of total forest (Hedges 2006a). Therefore the primary forest of Haiti is likely to be < 1% of total land area, and that of the Dominican Republic, ~5% of land area. There are national parks and protected areas in Haiti and the Dominican Republic, but deforestation takes place within park boundaries and therefore they do not afford complete protection, and often they offer no protection.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Mabuya hispaniolae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and charcoaling, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands. All mongoose-free islets of Hispaniola need to be thoroughly surveyed for the possible presence of this species, or the other two species of skinks from Hispaniola.

Reproduction. One female, UMMZ 239592 (92.6 mm SVL), contained five developing young (UMMZ 239593–97). The date of collection for that specimen was 7 May 1937.

Etymology. The species name (*hispaniolae*) is a feminine genitive singular noun, referring to the distribution of the species on the island of Hispaniola.

Remarks. Ciudad Trujillo was the name given to the capital city of Santo Domingo by the dictator Rafael Trujillo during his first reign of power (1930–1938); it reverted back to "Santo Domingo" after 1961. The type-locality was spelled incorrectly as "Ciudad Frujillo" by Cochran (1941), who compared the three adults collected by Roys with MCZ R-3617 (herein named *S. haitiae* **sp. nov.**), also from Hispaniola, treating all as members of the widespread species *Mabuya mabouya*. She noted that they agreed "in almost every way," but her table of characters showed that MCZ R-3617 differed substantially in scalation (nuchals, midbody scale rows, ventrals) from the other three specimens. Cochran indicated three supraoculars in MCZ R-3617, but it has four on both sides; supraoculars are another character separating it (*S. haitiae* **sp. nov.**) from *M. hispaniolae* **sp. nov.** She also considered the patterns to be "very similar," but MCZ R-3617 has relatively wide nape stripes as in members of the Genus *Spondylurus*, while the Roys specimens have a spotted dorsum with lateral stripes and only a hint of dorsolateral stripes, as in members of the Genus *Mabuya*. Subsequent authors (Schwartz & Thomas 1975; Miralles 2005) appear to have followed Cochran in treating these specimens as members of a single, widespread, species of skink in the Greater Antilles.

The fact that this species is represented by three large lizards collected in the capital city of the country during the 20th century (1937), and at no other location or time, caused us to consider another possibility: that the locality was in error. The type series was collected by Chester Crosby Roys (1912–2002), an entomologist and later a professor of marine biology at Tufts University, Boston. The insect literature and UMMZ records indicate that he collected insects, amphibians, and reptiles in the West Indies (Jamaica, Haiti, the Dominican Republic, St. Thomas, St. Kitts, and Dominica) in 1937, while a PhD student at the University of Michigan. His collection on Dominica was of particular interest because a close relative of *Mabuya hispaniolae* **sp. nov.**, *M. dominicana*, occurs there. However, his field notes and records of other material at UMMZ (G. Schneider, personal communication) confirm that he was in Santo Domingo city on 7–8 May 1937 and stayed at the "Palace Hotel," where he indicated that these three *Mabuya* were collected. He also collected three species of *Anolis* (*A. chlorocyanus*, *A. cybotes*, and *A. distichus*) at that hotel, on those dates, that are native to the island and which are now in the UMMZ collection. He visited Dominica later in the trip, in June, 1937. Cochran (1941) discussed these specimens and their Hispaniolan locality only a few years after they were collected, indicating that any locality mix-up must have occurred soon after collection. This information, combined with the fact that these three specimens can be distinguished from the other seven species in the genus by several diagnostic characters, as noted above, led us to conclude that the collection data are probably correct. The general rarity of *Mabuya* in the West Indies, and especially on Hispaniola where the mongoose was introduced, may explain why *M. hispaniolae* **sp. nov.** has been seen only once.

Besides *Mabuya hispaniolae* **sp. nov.**, two other species of skinks occur on the island: *Spondylurus haitiae* **sp. nov.**, not seen since the only known specimen (MCZ R-3617) was collected in 1857–58, and *S. lineolatus*, a rare species that has not been seen since 1985. Both of those other species apparently have been severely impacted by the mongoose. A lizard specimen in the Slater Museum (PSM 10269), labeled as *Mabuya mabouya* from Restauración, Dominican Republic, was examined by us and found to be *Celestus costatus* (Anguidae). Also, BMNH 1982.1448 from Port-au-Prince Haiti, cataloged as *Mabuya mabouya*, is not a skink and probably a *Celestus* as well (Colin McCarthy, personal communication).

Mabuya mabouya **(Bonnaterre 1789)**

Greater Martinique Skink
(Figs. 31C, 32G, 44)

Lacerta mabouya—Bonnaterre, 1789:51 (new neotype designation: MNHN 5421, from "Martinique").
Lacerta mabouya—Shaw, 1802:287.
Scincus mabouya—Daudin, 1803:375.
Scincus cepedii—Merrem, 1820:71.
Mabuya dominicensis—Fitzinger, 1826:52 (substitute name).
Scincus mabouya—Gray, 1831:69.
Tiliqua cepedii—Cocteau, 1837 (substitute name; mentioned in Duméril & Bibron, 1839, p. 646, and by later authors; two brief extracts published by Cocteau [1837a,b], but apparently the full manuscript, with names, was never published).
Eumeces mabouia—Duméril & Bibron, 1839:646 (part; incorrect emendation).
Mabouya cepedii—Gray, 1845:95 (part).
Mabuia cepedii—Cope, 1862:186 (part).
Mabuya cepedi—Bocourt, 1879:406 (part).
Mabuia agilis nigropunctata—Boulenger, 1887:192.
Mabuya mabouia—Barbour, 1914:321 (part; incorrect emendation).

Mabuya maboia—Barbour, 1914:355 (part; incorrect emendation).
Mabuya mabouia—Barbour, 1930:105 (part; incorrect emendation).
Mabuya mabouia—Barbour, 1935:129 (part; incorrect emendation).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part; incorrect emendation).
Mabuya mabouia—Underwood, 1963:83 (part; incorrect emendation).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Miralles, 2005:49 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Material examined (n = 9). Martinique. MNHN 5421 (neotype; photographs), donated by Neumann, no other information available; BMNH 53.2.4.39, accessioned in the BMNH 4 February 1853; MCZ R-6010, W. B. Richardson; MCZ R-6047, Samuel Walton Garman, St. Pierre, Martinique, 3 February 1879; MCZ R-6048 and R-185621, Samuel Walton Garman, Fort-de-France, Martinique, 8 February 1879; MNHN 1785, Auguste Plée, no specific locality, ca. 1820; MNHN 5110, Droz, no specific locality. "Antilles." MNHN 1889.0664, Gardemal, 1889.

Diagnosis. *Mabuya mabouya* is characterized by (1) maximum SVL in males, 83.9 mm; (2) maximum SVL in females, 101.2 mm; (3) snout width, 2.52–3.23% SVL; (4) head length, 16.2–19.4% SVL; (5) head width, 12.1–14.9% SVL; (6) ear length, 1.09–1.91% SVL; (7) toe-IV length, 10.2–12.5% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, three (13%), four (88%); (11) frontoparietals, two; (12) supralabial below the eye, five (63%), six (38%); (13) nuchal rows, one (88%), two (13%); (14) dorsals, 55–61; (15) ventrals, 65–75; (16) dorsals + ventrals, 122–135; (17) midbody scale rows, 26–34; (18) finger-IV lamellae, 13–16; (19) toe-IV lamellae, 17–19; (20) finger-IV + toe-IV lamellae, 30–34; (21) supranasal contact, Y (13%), N (88%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y (17%), N (83%); and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. mabouya* is separated from *M. cochonae* **sp. nov.**, *M. desiradae* **sp. nov.**, *M. grandisterrae* **sp. nov.**, and *M. guadeloupae* **sp. nov.** by having a longer frontonasal scale (frontonasal length 20.7–23.5% HL versus 17.8–19.9% in those other species; Fig. 34). It differs from *M. dominicana* by having a wider supranasal (supranasal length/supranasal width 3.61–4.28 versus 4.57–6.57 in *M. dominicana*; Fig. 35). It differs from *M. grandisterrae* **sp. nov.**, *M. hispaniolae* **sp. nov.** and *M. montserratae* **sp. nov.** by having a higher supraciliary-2/supraciliary-3 length ratio (1.92–2.19 versus 1.39–1.79; Fig. 36). In pattern (Fig. 32), *M. mabouya* differs from *M. dominicana* and *M. hispaniolae* **sp. nov.** in having a shorter dark lateral stripe and in lacking a dark ventrolateral stripe.

Description of neotype (Fig. 44A–C). The following is based on our examination of photographs. An unsexed adult in excellent state of preservation, without injuries and without an abdominal slit. SVL 99.8 mm; tail length not measured (regenerated); HL 19.4 mm; HW, SW, EL, and toe-IV length not measured; ear-opening average in size and round; fingers and toes clawed; order of toe length could not be scored.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraocular, and frontal. Frontal pentagonal, in contact with the first supraocular and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with a posterodorsal projection on latter. Three or four upper preoculars and two lower preoculars. Seven supraoculars on the right and eight on the left, the fifth (on the right) or sixth (on the left) being the widest and forming the lower border of the eyelid. Five to seven moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

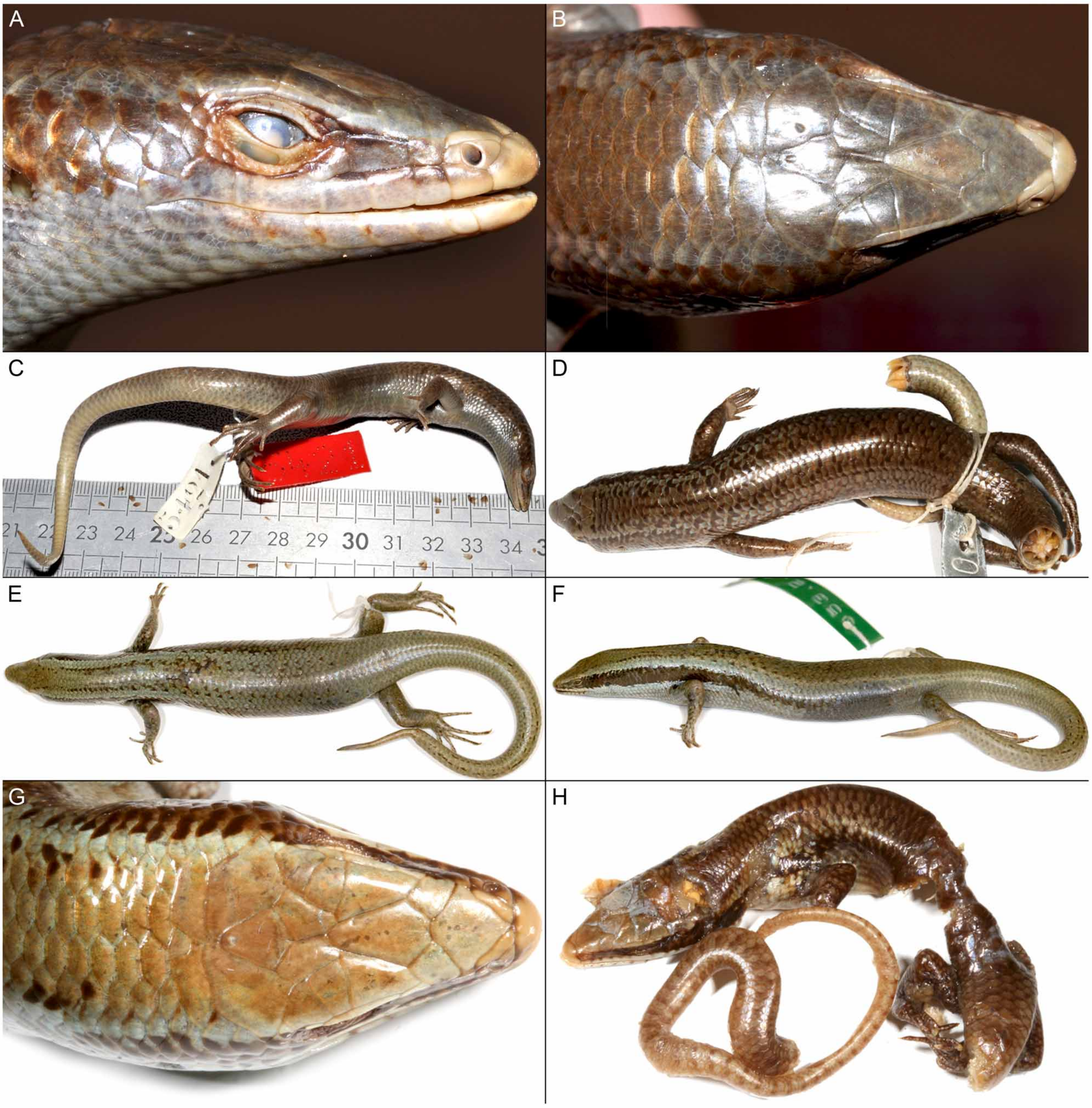

FIGURE 44. *Mabuya mabouya*, from Martinique. (A–C) MNHN 5421, neotype, "Martinique." Photographs courtesy of Ivan Ineich. (D) MCZ R-6010, "Martinique." (E–F) BMNH 53.2.4.39, "Martinique." (G) MCZ R-6048, Fort-de-France, Martinique. (H) fetus of MCZ R-6048.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 55 in a longitudinal row; ventrals similar to dorsals; not counted; 29 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On tail, one enlarged row each of middorsal and midventral scales with lateral rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, not counted on fingers or toes. Preanal scales similar to ventrals. Enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brown with small dark brown spots, distributed on body, limbs, and tail, but largely absent in pelvic region and anterior portion of tail. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region to first third of body. Pale middorsal stripe absent. Pale dorsolateral stripes present, gray, extending from top of head to approximately the forelimbs. Pale lateral stripes absent. Ventral surface of body without pattern. Color of palmar and plantar surfaces could not be scored. No information is available on color in life of the neotype.

Variation. Variation in scalation and coloration (Tables 4–5) appears to be slightly greater than seen in other species, but Martinique is a large island that is a composite of multiple paleoislands, and other reptiles show geographic variation within Martinique (Breuil 2002; Hedges 2008; Thorpe *et al*. 2010). For example, midbody scale rows vary from 26–34, and one individual (MCZ R-6010; Fig. 44D) is heavily spotted. However the variation appears to be discordant, and most specimens do not have specific locality data, preventing any geographic associations. The pattern of one fetus examined (from MCZ R-6048) is also heavily spotted, contrasting with fetuses of other species in the genus. There is a trace of throat (ventral) striping in one specimen (BMNH 53.2.4.39), but it is difficult to tell if it is real or an artifact of preservation. We score toe length order in this species as I < V < II < III < IV; Miralles (Miralles 2005) scored the neotype order as I < II < III = V < IV, but we suspect the difference may reflect different methods of scoring this trait.

Distribution. The species is distributed on Martinique, where it is known from two specific localities on the west coast of the island: St. Pierre and Fort-de-France (Fig. 11C), but likely occurred throughout the island (or at least the north paleo-island), before the mongoose was introduced.

Ecology and conservation. No ecological data are recorded for any of the specimens. Because populations and species of *Mabuya* are exceedingly rare or possibly extinct on essentially all islands where the mongoose has been introduced, and because this species has not been seen since 1889, it may be extinct as well (Lorvelec *et al.* 2007; Breuil 2009). Barbour (1937) considered it to be extinct on Martinique.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *M. mabouya* to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands. There are islets of Martinique that do not have mongooses and might sustain populations of this skink.

Reproduction. MCZ R-6048 (99.5 mm SVL; coll. 8 February, 1879) has two well-developed young, although both are fragmentary due to poor preservation.

Etymology. The species name (mabouya) is a feminine singular noun derived from the same name used by native peoples of the Americas, especially the Antilles, for various types of lizards.

Remarks. Miralles (2005) designated a neotype (MNHN 5421) for *Lacertus mabouya* Lacepède, but the ICZN (2005) has ruled that the entire work of Lacepède (1788) is rejected as an unavailable, non-binominal work. Therefore the species name reverts to Bonnaterre (1789). However, Bonnaterre did not indicate a type, and thus we have designated MNHN 5421 as the neotype of *Lacerta mabouya* Bonnaterre (1789).

Miralles (2005) reported that MNHN 1889.0664 was from Guadeloupe. However, the MNHN records the locality as "Antilles" (no specific locality). Our examination indicates that it has the diagnostic characters of *Mabuya mabouya* and therefore is likely from Martinique. Auguste Plée (1787–1825) collected in Martinique in ca. 1820 for the MNHN, therefore constraining the date of collection of MNHN 1785.

Mabuya montserratae **sp. nov.**
Montserrat Skink
(Figs. 31D, 32H, 45)

Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:38 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya bistriata—Malhotra & Thorpe, 1999:75 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. MCZ R-125464, an adult male, collected 6 August 1970 between Killecrankie Mydram, Waterworks Estate, and Molyneux Village, Montserrat, by J. Boos.

Paratypes (n = 7). Montserrat. BMNH 94.9.20.8, F. Watts, no specific locality, accessioned 20 September 1894; and USNM 30850 (n = 6), July 1902 (no additional collection information available).

Diagnosis. *Mabuya montserratae* **sp. nov.** is characterized by (1) maximum SVL in males, 85.3 mm; (2) maximum SVL in females, 98.0 mm; (3) snout width, 2.80–3.33% SVL; (4) head length, 17.1–18.6% SVL; (5) head width, 12.3–13.2% SVL; (6) ear length, 1.49–1.55% SVL; (7) toe-IV length, 9.51–11.4% SVL; (8) prefrontals, two; (9) supraoculars, three; (10) supraciliaries, four (only three appear to be present in some fetuses, but they are in poor condition); (11) frontoparietals, two; (12) supralabial below the eye, five (63%), six (38%); (13) nuchal rows, one (88%), two (13%); (14) dorsals, 57–63; (15) ventrals, 64–71; (16) dorsals + ventrals, 123–134; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 14–15; (19) toe-IV lamellae, 16–18; (20) finger-IV + toe-IV lamellae, 30–33; (21) supranasal contact, Y (25%), N (75%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Mabuya*, *M. montserratae* **sp. nov.** differs from all other species by having a shorter frontonasal (frontonasal length 16.5–16.8% HL versus 17.8–23.9% in those other species; Fig. 34). It differs from *M. dominicana*, *M. grandisterrae* **sp. nov.**, *M. guadeloupae* **sp. nov.**, and *M. mabouya* by having a lower supraciliary-2/supraciliary-3 length ratio (1.39–1.66 versus 1.67–2.40 in those other species; Fig. 36). It differs from *M. dominicana* and *M. mabouya* in having a wider supranasal (supranasal length/supranasal width 3.19–3.58 versus 3.61–6.57 in those other species; Fig. 35). It is separated from *M. hispaniolae* **sp. nov.** by having a larger ear (ear length 1.49–1.55% SVL versus 1.11–1.46% in *M. hispaniolae* **sp. nov.**). Additionally, *M. montserratae* **sp. nov.** tends to have more midbody scale rows than *M. hispaniolae* **sp. nov.**: 32 (four individuals) and 34 (four) versus 30 (six) and 32 (two). Also, the fetuses of *M. montserratae* **sp. nov.** are spotted and lack dark dorsolateral stripes whereas the fetuses of *M. hispaniolae* **sp. nov.** have dark dorsolateral stripes, at least anteriorly. Although hard to quantify in old specimens, the ear of *M. montserratae* **sp. nov.** also differs in shape from other species in being dorsoventrally elongated, versus more rounded.

Description of holotype (Figs. 31D, 45A–C). An adult male in good state of preservation, with an injury (in the first half of the body posterior to the left forelimb) and without an abdominal slit. SVL 85.3 mm; tail length not measured (complete); HL 15.9 mm; HW 11.0 mm; SW 2.70 mm; EL 1.32 mm; and toe-IV length 9.71 mm; ear-opening average in size and oval; toe length in the following order: I < II = V < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the first supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posterodorsal projection on latter. One upper preocular and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Four moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin curved toward the tip of the snout. Postmental scale and three pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by smaller cycloid scales.

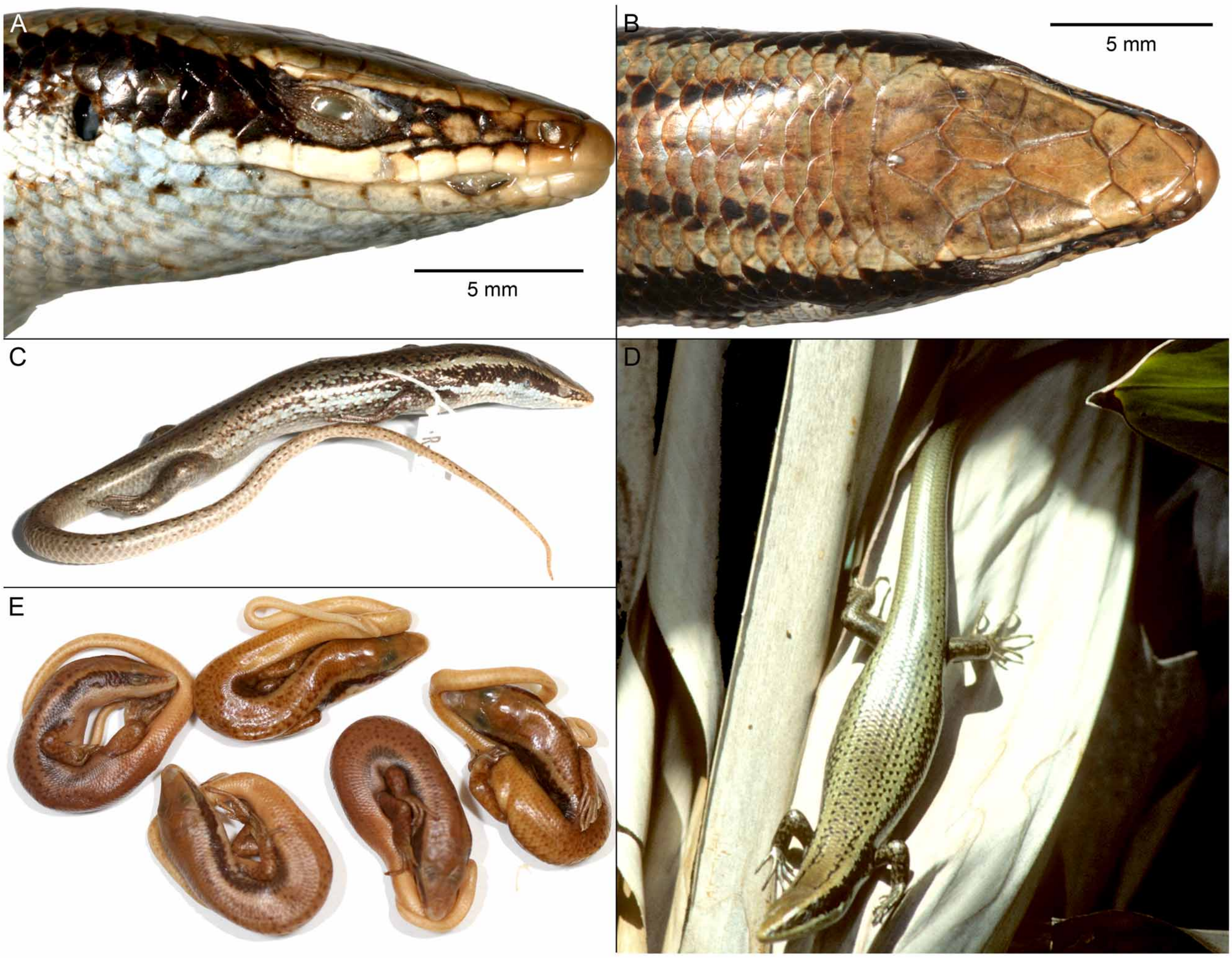

FIGURE 45. *Mabuya montserratae* **sp. nov.**, from Montserrat. (A–C) MCZ R-125464, holotype, between Killecranckie Mydram Waterworks Estate and Molyneux Village, Montserrat. (D) uncataloged, Woodlands (live individual, photographed by Q. Bloxam, Durrell Wildlife Conservation Trust, in 1984). (E) fetuses of USNM 30850, Montserrat (no additional locality data).

Body and limb scalation. One row of two fused nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 67 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 15 under finger-IV and 17 under toe-IV. Preanal scales larger than ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium greenish-brown with small dark brown spots, uniformly distributed on body and tail and in two dorsolateral bands extending from behind nuchals to forelimbs. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown with pale spots between forelimbs and midbody, continuous from loreal region to midbody and broken into a series of dark brown spots from midbody to hindlimbs. Pale middorsal stripe absent. Pale dorsolateral stripes essentially absent; faintly evident in fetuses. Pale lateral stripes present, whitish, extending from below ear to last third of body, bordered below by a series of dark brown spots. Limbs brownish with darker brown mottling on dorsal surfaces and gray on ventral surfaces. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

Variation. In coloration and scalation, other specimens resembled the holotype (Tables 4–5), and the photograph of the live specimen (Fig. 45D) is similar in showing a nearly uniform brown dorsum with spots and faint traces of pale dorsolateral stripes. Pattern and coloration of the fetuses are consistent with adults.

Distribution. The species is distributed on Montserrat (Fig. 11E). Only two localities are known. The holotype was collected in the central uplands above the abandoned town of Plymouth. That region was severely affected by the recent volcanic eruptions on the island, and satellite imagery shows no remaining forest in that area. Woodlands (Fig. 45D) is the other locality, and it is on the central west coast, close to the area affected by the volcanic eruptions.

Ecology and conservation. Although the mongoose is absent, introduced rats are present in the forests of Montserrat, and these mammals are known to have a significant negative effect on native reptiles (Young 2008). Also, forest habitats in the southern and central portions of Montserrat were considerably affected by the volcanic eruptions that began on 26 April 1995. The two known localities of this species are in that zone, and only two other individuals have been seen or collected, the most recent one being photographed in 1984 (Fig. 45D). All native species of lizards recorded from Montserrat were sighted in a recent and extensive biodiversity survey, except *Mabuya* (Young 2008).

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *M. montserratae* **sp. nov.** as Critically Endangered (CR A2ace) and possibly extinct. It faces a primary threat from predation by introduced predators, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. One female (98.0 mm SVL) contained five developing young. The date of collection for that specimen was July, 1902.

Etymology. The species name (*montserratae*) is a feminine genitive singular noun, referring to the distribution of the species on the island of Montserrat.

Remarks. Two of the three known specimens of *Mabuya* from Montserrat were in museum collections at the beginning of the 20th century, but they were overlooked by Barbour (1914:355) in his detailed review of the zoogeography of the West Indian herpetofauna. Dunn (1936) was the first to note the presence of *Mabuya* on Montserrat, but he considered them to be members of his wide-ranging species, *M. mabouya*. Underwood (1963) omitted the island from the distribution of *M. mabouya*, but it was reinstated again by Schwartz and Thomas (1975) and Schwartz and Henderson (1988, 1991). Most recently, Miralles (2005) inadvertently omitted Montserrat from the distribution of *M. mabouya*. *Mabuya montserratae* **sp. nov.** is the northernmost species in the Genus *Mabuya*, in the Lesser Antilles.

Genus *Manciola* gen. nov.

South American Small-handed Skinks

Type species. *Mabuya guaporicola* Dunn, 1936:549.

Diagnosis. The species in this genus is characterized by (1) frontoparietals, two, (2) supraciliaries, four, (3) supraoculars, four, (4) prefrontal contact, absent or rare, (5) parietal contact, present, (6) rows of nuchals, one, (7) dorsals + ventrals, 136–141, (8) total lamellae, 147–154, (9) a dark middorsal stripe, present, (10) dark dorsolateral stripes, present, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. The maximum body size in the single included species is 98 mm SVL (Dunn 1936; Table 2).

Besides the unusual dark middorsal stripe (not visible in all specimens), this genus also differs from others in having exceptionally short limbs and small hands and feet. In its low number of total lamellae (147–154), it differs from all other genera (> 157 total lamellae), although this character was not scored in *Exila*, *Maracaiba*, and *Orosaura*. However, *Manciola* differs from those three genera and *Capitellum*, *Copeoglossum* (except *C. arajara*), *Mabuya*, and *Psychosaura* in having pale (versus dark) palms and soles. From *Exila*, *Notomabuya*, and *Panopa*, *Manciola* differs in having two frontoparietals (versus one fused frontoparietal in those other genera). In having four supraoculars, *Manciola* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). The presence of a single nuchal row separates this genus from *Exila* and *Panopa* (2–5 nuchal rows) and from most *Spondylurus* (usually 2–3 rows, rarely one). The presence of contact between the parietals separates this genus from *Copeoglossum*. It differs from *Alinea* by having fewer finger-IV + toe-IV lamellae (21–22 versus 28–36), having dark lateral stripes, and lacking ventral striping.

Content. One species is placed in this genus: *Manciola guaporicola* (Table 1).

Distribution. This genus is distributed in eastern and southern Brazil and in Bolivia (Avila-Pires 1995; Fig. 8b).

Etymology. The generic name (*Manciola*) is a feminine, Latin, noun meaning small hand, in reference to the relatively small hands and feet in these skinks.

Remarks. The molecular phylogeny (Fig. 5) does not clearly establish the relationship of this genus to others. The relationship to *Brasiliscincus* in the tree is not significant, although Rodrigues (2000) allied *Manciola guaporicola* with species placed here in *Brasiliscincus* based on some pattern similarities. The two genera also have relatively small hands and feet as reflected in low numbers of total digital lamellae: 157–194 in *Brasiliscincus* and 147–154 in *Manciola*. No molecular data were available for *Capitellum* (the three included species are likely extinct) but that genus also is characterized by relatively low numbers of lamellae (167–190) and, considering other characters (see below), probably also is a close relative of *Brasiliscincus* and *Manciola*. The molecular phylogenies (Figs. 5–7) show relatively deep divergences (4–5%, cyt b) among specimens of *M. guaporicola* from different localities suggesting that there are likely additional species of *Manciola* not yet recognized.

Genus *Maracaiba* gen. nov.

Maracaibo Skinks

Type species. *Mabuya meridensis* Miralles, Rivas, & Schargel, 2005:3.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, four, (3) supraoculars, four, (4) prefrontal contact, absent (or contact very rarely in *M. meridensis*), (5) parietal contact, present (occasionally no contact in *M. zuliae*), (6) rows of nuchals, one, (7) dorsals + ventrals, 127 (one specimen examined by us, using our counting method), (8) total lamellae, not counted, (9) a dark middorsal stripe, present and absent, (10) dark dorsolateral stripes, absent (see Remarks), (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. The range of maximum body sizes among the species is 77–101 mm SVL (Table 2).

Maracaiba is distinguished from *Brasiliscincus*, *Manciola*, and *Notomabuya* by having dark (versus pale) palms and soles. The presence of two frontoparietals (unfused) separates this genus from *Exila*, *Notomabuya*, and *Panopa* (one frontoparietal). The presence (versus absence) of dark lateral stripes distinguishes this genus from *Alinea*. *Maracaiba* is separated from *Brasiliscincus* and *Varzea* by having a higher number of dorsals + ventrals (127 versus 113–126). From *Capitellum*, *Maracaiba* differs in having four supraciliaries (versus 5–6). From *Marisora*, it differs (weakly) by having a high number of dorsals (63 versus 50–63; only three of 80 *Marisora* examined with 63 dorsals). From *Copeoglossum*, *Maracaiba* differs by having parietal contact (versus usually no contact) and a higher number of dorsals + ventrals (127 versus 105–120). In having four supraoculars, *Maracaiba* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). It differs from *Manciola* in having fewer dorsals + ventrals (127 versus 136–141). The presence of a single nuchal row separates this genus from *Exila* and *Panopa* (2–5 nuchal rows) and from most *Spondylurus* (usually 2–3 rows, rarely one). It also differs from *Spondylurus* in having poorly-defined dorsolateral dark and pale stripes (well-defined in *Spondylurus*). *Orosaura* has what appears to be a pair of irregular, dark nape stripes or lines of spots immediately adjacent to the pale dorsolateral stripes (Miralles *et al.* 2009) whereas this pattern is lacking in *Maracaiba*. *Maracaiba* differs from *Psychosaura* in having a typical mabuyine head shape (subacuminate) versus a prominent, acuminate head shape in *Psychosaura*.

Content. Two species are placed in this genus: *Maracaiba meridensis* and *M. zuliae* (Table 1).

Distribution. Species in this genus are found in northern Venezuela, in the general region of Lago de Maracaibo; Fig. 8C. Their altitudinal ranges differ greatly, with *M. meridensis* 1300–2200 m and *M. zuliae* 0–1500 m.

Etymology. The generic name (*Maracaiba*) is a feminine noun and refers to the distribution of the genus, centered around Lago de Maracaibo in northern Venezuela.

Remarks. *Maracaiba* is most closely related (91% bootstrap support) to the three other genera in the northern portion of the distribution of Mabuyinae: *Mabuya*, *Marisora*, and *Orosaura* (Fig. 5). Together, along with *Alinea* (see Discussion), they form the Northern Clade. The two included species in *Maracaiba* cluster closely (100% bootstrap support). In the original descriptions of those species, emphasis was placed on their number of dark stripes, in both distinguishing them from one another and from other species: *Maracaiba meridensis* was characterized as having seven stripes and *M. zuliae* four stripes (Miralles *et al.* 2005b; Miralles *et al.* 2009b). Although we have limited experience with these species, having examined only one *M. meridensis*, our inspection of the photos and illustrations of *M. meridensis* (Miralles *et al.* 2005b) leads us to conclude that it is more dorsally spotted than *M. zuliae* but otherwise does not have dark dorsolateral stripes (as are normally scored as stripes in mabuyines). The narrow dark middorsal stripe also appears to be weakly defined. We are not questioning the species level distinction of *M. meridensis* and *M. zuliae* but rather the count of stripes and how it relates to characterizing and diagnosing this genus. More specimens need to be surveyed for the diagnostic traits that we mention above, but we consider this genus to be well-diagnosed when considering both the molecular and morphological data.

Genus *Marisora* gen. nov.

Middle American Skinks

Type species. *Mabuya unimarginata* Cope, 1862:187.

Diagnosis. Species of the Genus *Marisora* are characterized by (1) frontoparietals, two (rarely three), (2) supraciliaries, four (occasionally three, five, or six), (3) supraoculars, four (rarely three), (4) prefrontal contact, absent (or contact very rarely), (5) parietal contact, present (or occasionally no contact), (6) rows of nuchals, one (rarely two rows), (7) dorsals + ventrals, 109–131, (8) total lamellae, 184–229, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, usually absent (present in *M. alliacea* **comb. nov.**), (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. Species of *Marisora* are medium to large, with a range of maximum body sizes among the species of 82–95 mm SVL (except for one species, *M. magnacornae* **sp. nov.**, known from a single 77.4 mm specimen; Table 2).

All *Marisora* have a basic pattern, usually bold and well-defined, of a dark lateral band several scales wide bordered below by a narrow pale stripe usually less than one scale wide. In two species (*M. aurulae* **sp. nov.** and *M. falconensis*), this basic pattern is weakly defined, and in another (*M. alliacea*), there are additional (dorsolateral) dark stripes. The absence of dark dorsolateral stripes (except in *M. alliacea*) distinguishes this genus from *Aspronema*, *Brasiliscincus* (most individuals), *Manciola*, *Orosaura*, *Panopa*, *Psychosaura*, *Spondylurus*, and *Varzea* (most individuals). The presence of one row of nuchals (rarely two) distinguishes the Genus *Marisora* from *Exila* and *Panopa* (2–5 rows) and most *Spondylurus* (usually 2 rows). The presence of two (rarely three) frontoparietals (instead of one fused scale) distinguishes this genus from *Exila*, *Notomabuya*, and *Panopa*. The presence of a pale lateral stripe and absence of dark ventral striping distinguish this genus from the Genus *Alinea*. The absence of a middorsal dark stripe further distinguishes this genus from *Aspronema*. The presence of four (usually) supraciliaries (versus 5–6) distinguishes *Marisora* from *Capitellum* and *Exila*. Contact (usually) of the parietal scales distinguishes this genus from the Genus *Copeoglossum* (parietals usually not in contact). In having four supraoculars (rarely three), *Marisora* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). In having 184–229 total lamellae, it is distinguished from *Manciola* (147–154 lamellae) and *Alinea* (231–259 total lamellae). From *Maracaiba*, it differs (weakly) by having a low number of dorsals (50–63 versus 63; only three of 80 *Marisora* with 63 dorsals).

Content. Seven species are placed in this genus: *Marisora alliacea*, *Marisora aurulae* **sp. nov.**, *Marisora brachypoda*, *Marisora falconensis*, *Marisora magnacornae* **sp. nov.**, *Marisora roatanae* **sp. nov.**, and *Marisora unimarginata* (Table 1).

Distribution. The Genus *Marisora* is distributed throughout Middle America from central Mexico (Colima in the west and Veracruz in the east) to southern Panama, in northern South America (Colombia, and Venezuela; primarily in the Caribbean lowlands), and on Caribbean islands relatively close to mainland areas (Cozumel, Mexico; Bay Islands, Honduras; Great Corn Island, Nicaragua; Trinidad and Tobago; Grenada, the Grenadines, and St. Vincent (Figs. 1, 8A, 9E, and 11D, I–J).

Etymology. The generic name (*Marisora*) is a feminine noun derived from the Latin words *maris* (sea) and *ora* (coast, or border), referring to the distribution of this genus occurring predominately in low elevations near the coast (Caribbean, Atlantic, and Pacific), with relatively few inland and upland localities. Three of the seven species occur exclusively on islands.

Remarks. No attempt was made here to conduct a comprehensive revision of mainland mabuyine skinks from Middle America or South America. Nonetheless, it was necessary for us to examine a sufficient number of specimens from those regions to compare with specimens treated here from Caribbean islands. In doing so we were able to evaluate two previously named Middle American species, *Mabuya alliacea* Cope and *Mabuya brachypoda* Taylor, that have been recognized by some (Burger 1952; Taylor 1956; Webb 1958; Flores-Villela 1993; Campbell 1998) but not by others (Dunn 1936; Peters & Donoso-Barros 1970; Savage 2002; Miralles *et al*. 2009b).

Burger (1952) objected to Dunn's (1936) arrangement of placing nearly all American taxa in *Mabuya mabouya*. He noted variation in some specimens collected in Middle America and resurrected *Mabuya mabouya alliacea* as a subspecies. However, he examined only four characters, which he admitted were insufficient. The study by Taylor (1956) was more comprehensive. He examined a larger number of specimens, all from Costa Rica, tabulated measurements and scale counts, and concluded that three species were present in that country, naming one of them *Mabuya brachypoda*. Taylor (1956) used standard measurements and scale counts and some non-standard characters (e.g., paired chin shields contacting labials) to diagnose the three taxa.

Taylor (1956) showed that Cope's *Marisora alliacea* could be diagnosed and that all of the specimens of that species occurred in eastern Costa Rica, on the Atlantic slope of the cordillera. All had long limbs, a dorsal pattern of dark dorsolateral stripes (absent in other Middle American mabuyine skinks), a low number of midbody scale rows (26–29), supranasal separation (or only point contact), and greenish color in life. Except for the dorsal stripe pattern, each of the characters individually can be found in the other two species, albeit rarely or uncommonly, but in combination they are diagnostic. He examined 17 specimens of the species from Costa Rica. We examined five other specimens from eastern Costa Rica (UF 30454, 30459, 30460, 30467, and 30471) and a specimen from adjacent southern Nicaragua (USNM 19542), all conforming to the characterization of this species by Cope (1876) and Taylor (1956). In addition, we note that all of the specimens we examined have dark venters in preservative. We see no evidence that the range of this species occurs beyond eastern Costa Rica and southern Nicaragua, although a more comprehensive examination of material is needed to better define its distribution. It appears to be the only species of *Marisora* occurring on the Atlantic slope of Costa Rica.

Taylor (1956) divided the remaining mabuyine skinks of Middle America into a long-limbed species, here *Marisora unimarginata*, with dark dorsal spots and a short-limbed species usually lacking spots, which he described as *Mabuya brachypodus* (later, corrected to *M. brachypoda* as the species name is adjectival, "short-footed"). He considered *Marisora unimarginata* to occur in Panama and western Costa Rica (Pacific slope) and *Marisora brachypoda* to also occur in western Costa Rica (Pacific slope) north to Mexico, although the only material he examined of both species was from Costa Rica. He found that in most *M. unimarginata* the sixth supralabial was below the eye (fifth in *M. brachypoda*) and only one pair of chin scales contacted the infralabials (two pairs contacted the infralabials in *M. brachypoda*). Both species have primarily 30 or 32 midbody scale rows, but the latter is a rare count in *M. brachypoda* and the specimens with 32 scale rows may not be *M. brachypoda* (see below).

Because the holotype of *Marisora unimarginata* (now unlocated and presumably lost) is from Panama, and Cope (1876) made no mention of dark dorsal flecks or spots, Taylor (1956) was concerned that his well-spotted Costa Rican *M. unimarginata* might be yet another new species. However, some specimens of *Marisora* that we have examined from Panama (e.g., CM 43594), otherwise agreeing with *M. unimarginata*, have dorsal spotting, so apparently it is a variable character. Taylor noted that localities for the two species (*M. brachypoda* and *M. unimarginata*) in western Costa Rica were as close as 10 km and at the same elevation, suggesting that they do not intergrade or hybridize and further supporting their recognition at the species level.

Limb length has been a standard character in mabuyine systematics, often used in a non-quantitative manner, by scoring whether the adpressed limbs (arms back, legs forward) overlap or not. This comparison can be accomplished with soft specimens, but the limbs of many preserved specimens are too stiff to bend without damaging them. Nonetheless, it is possible in even those specimens to measure arm and leg lengths. Taylor (1956) did this and presented his results in tables. To those data, we have added limb length measurements of specimens we examined, combined arm and leg lengths, and plotted all against SVL (see below). First, it should be acknowledged that there is significant measurement error, given that few limbs can be perfectly straightened and measured (and, considering error in alternate measurements of bent limbs, using string). Nonetheless, most specimens separate into a short-limbed species (*Marisora brachypoda*) and long-limbed species (*M. alliacea* and *M. unimarginata*), consistent with other characters.

Savage (2002) disagreed with Taylor (1956) and instead recognized only one Middle American species, *Marisora unimarginata*, noting that populations of the various species recognized by Taylor (1956) in Costa Rica showed intergradation. However, Savage did not present evidence for this claim, and it disagrees with the evidence provided by Taylor (1956) and by material that we have examined, which includes geographically intermediate populations. The concordant nature of the character variation, and agreement with geography, suggest to us that Cope (1876) was correct in describing *M. alliacea*, and Taylor (1956) was correct in describing *M. brachypoda*, and in recognizing all three species.

There is evidence that additional species are present on the mainland of Middle America. Taylor (1956) noted that two individuals from Barracana, Costa Rica, had an unusual pattern of dark lines through each scale. We have also noticed that specimens of *Marisora brachypoda* from Honduras are similarly lineate and additionally possess distinctive pale ventrolateral stripes. Moreover, three specimens (TCWC 80536, UF 143817, and RT 1729) that we examined from Guanacaste, Cost Rica, differ considerably from other *M. brachypoda*, including specimens from Puntarenas, Costa Rica. They have shorter toes than any *M. brachypoda* (7.43–8.68% SVL versus 8.90–12.7%) and shorter heads than all but one *M. brachypoda* (14.9–15.7% SVL versus 15.6–21.4%). Their limb length is at the low extreme (arm + leg length 45.3–48.3% SVL versus 46.4–61.7%), and dorsals + ventrals are at the high extreme (124–129 versus 109–124). All three specimens have separated supranasals, whereas those scales are in contact in 25 of 29 other *M. brachypoda* examined, and in the holotype (Taylor 1956). In pattern, they have a more discontinuous dark lateral stripe than others. Otherwise, they have the key characters of *M. brachypoda*, including short limbs, two pairs of chin shields in contact with infralabials, and fifth supralabial below the eye. Because the holotype of *M. brachypoda* is from Guanacaste Province, this potential new species may be sympatric with *M. brachypoda*. Alternatively, it may represent the true *M. brachypoda*, in which case populations currently assigned to *M. brachypoda* from elsewhere will require a new name.

Relatively deep divergences (4–5%) among populations of *Marisora brachypoda* in the molecular phylogeny (Fig. 6), and paraphyletic branching, also suggests that multiple species are present. A comprehensive review of all Middle American specimens of *Marisora* is warranted to determine the number of species present and their distributions. However, we believe that it is more useful for systematists and non-systematists to recognize five diagnosable species (*M. alliacea*, *M. brachypoda*, *M. magnacornae* **sp. nov.**, *M. roatanae* **sp. nov.**, and *M. unimarginata*) in Middle America now, even though one (*M. brachypoda*) is paraphyletic and in need of further study, than to maintain the current taxonomy whereby a single species (*M. unimarginata* sensu lato), is recognized and known to be a complex of species.

Mijares-Urrutia and Arends (1997) described *Marisora falconensis* from the state of Falcón, Venezuela. Miralles *et al.* (2005a) located additional material of *M. falconensis* in museum collections that extended the distribution of the species, especially along the northern coast east of Falcón to the state of Sucre, Venezuela. They also assigned a specimen (UMMZ 54793) from Guajira, Colombia to that species. We have examined that Colombian specimen and agree that it is similar to *M. falconensis* in scalation and is a member of the Genus *Marisora*. However it has a wider (nearly two scale rows) pale lateral stripe and a narrower dark lateral stripe as compared with *M. falconensis*. Further comparisons with additional specimens are needed to determine whether *M. falconensis* or a related species occurs in Colombia.

Marisora falconensis has not yet been compared with *M. unimarginata* (*sensu stricto*) by any authors, morphologically or with molecular data. Available DNA sequences of *Marisora* from Middle America are from *M. brachypoda*, *M. alliacea*, and *M. roatanae* **sp. nov.** (described below), and those species appear to be well separated, genetically, from *M. falconensis* (Fig. 5). Also, *M. falconensis* can be distinguished, morphologically, from all three new species of the Genus *Marisora*, described below. However, *M. falconensis* and *M. unimarginata* share some characters including long limbs, broadly overlapping scale counts, and a pattern that includes (variably) dorsal spotting, although *M. falconensis* tends to be a darker species, at least in preservative. However, in having a weakly-defined dark lateral stripe, *M. falconensis* resembles *M. aurulae* **sp. nov.** One character that we found to distinguish most specimens of *M. falconensis* and *M. unimarginata* is the chin shield character. In *M. unimarginata*, there is usually (88%) one pair of chin shields posterior to the postmental that touch the infralabials (i.e., are not separated by a sublabial), whereas in *M. falconensis*, there are usually two (79%) or three (5%) such pairs of chin shields. However, a large number of Venezuelan and other South American specimens of *Mabuya* exist in museum collections that have not been examined by us or by previous authors. A comprehensive examination of this material is needed to better understand the systematics of mabuyine skinks from Venezuela and elsewhere in South America.

Below we describe three new species of the Genus *Marisora* from Caribbean islands. One species occurs in the Windward Islands (southern Lesser Antilles, Trinidad and Tobago) and is most closely related to *M. falconensis*. The other two are from islands off of Middle America (Great Corn and Roatán) and appear to be most closely related to species occurring in that geographic region (*M. alliacea*, *M. brachypoda*, and *M. unimarginata*). Morphological data, combined with molecular data for several of the species, show that all seven species form a clade (Genus *Marisora*) that is most closely related to two genera also occurring in that general geographic region: *Mabuya* of the Lesser Antilles and *Maracaiba* of Venezuela. This phylogenetic relationship has been observed previously using many of the same Genbank sequences (Miralles *et al.* 2005a; Miralles & Carranza 2010).

Marisora aurulae **sp. nov.**

Lesser Windward Skink
(Figs. 46A, 47A, 48)

Mabuia agilis—Boulenger, 1887:191 (part).
Mabuia aenea—Garman, 1887:53 (part).
Mabuya aenea—Barbour, 1914:322 (part).
Mabuya aenea—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya aenea—Underwood, 1963:83 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:40–41 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part); Murphy, 1997:150 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Miralles, 2005:49 (part?).
Mabuya falconensis—Miralles *et al.*, 2009:609 (part).
Mabuya mabouya—Henderson & Powell, 2009:292 (part).

Holotype. MCZ R-38196, an adult female from Young's Island, St. Vincent, collected 11 November 1934 by J. B. Myers.

Paratypes (n = 12). Grenada. MCZ R-79743, James Lazell, Glover Island, 21 June 1964; USNM 72658–59, Belmont, St. George (no collection date available). Grenadines. KU 242049, Albert Schwartz, Saline Bay, Mayreau (Mayero) Island, 13 December 1961; KU 242050, Albert Schwartz, Petit Bateau, Tobago Cays, 13 December 1961; MCZ R-79098, C. MacIntosh, Carriacou, 1963. Tobago. KU 242012, Albert Schwartz, 1 mile E Canaan (13 May 1963); MCZ R-12079–80, W. E. Broadway (no specific locality or collection date available); MCZ R-55668, Garth Underwood, Scarborough, 5 September 1956. Trinidad. MCZ R-100482–83, J. Boos, La Romain, 14 June 1967.

Other material (n = 4). Grenada. MCZ R-4514, P. Sellinan, no specific locality, ca. 1882 (see Remarks). Tobago. ZFMK 62602–03 (Buccoo, not examined). Unknown locality. ZMH R09305 ("St. Thomas," in error, see Remarks).

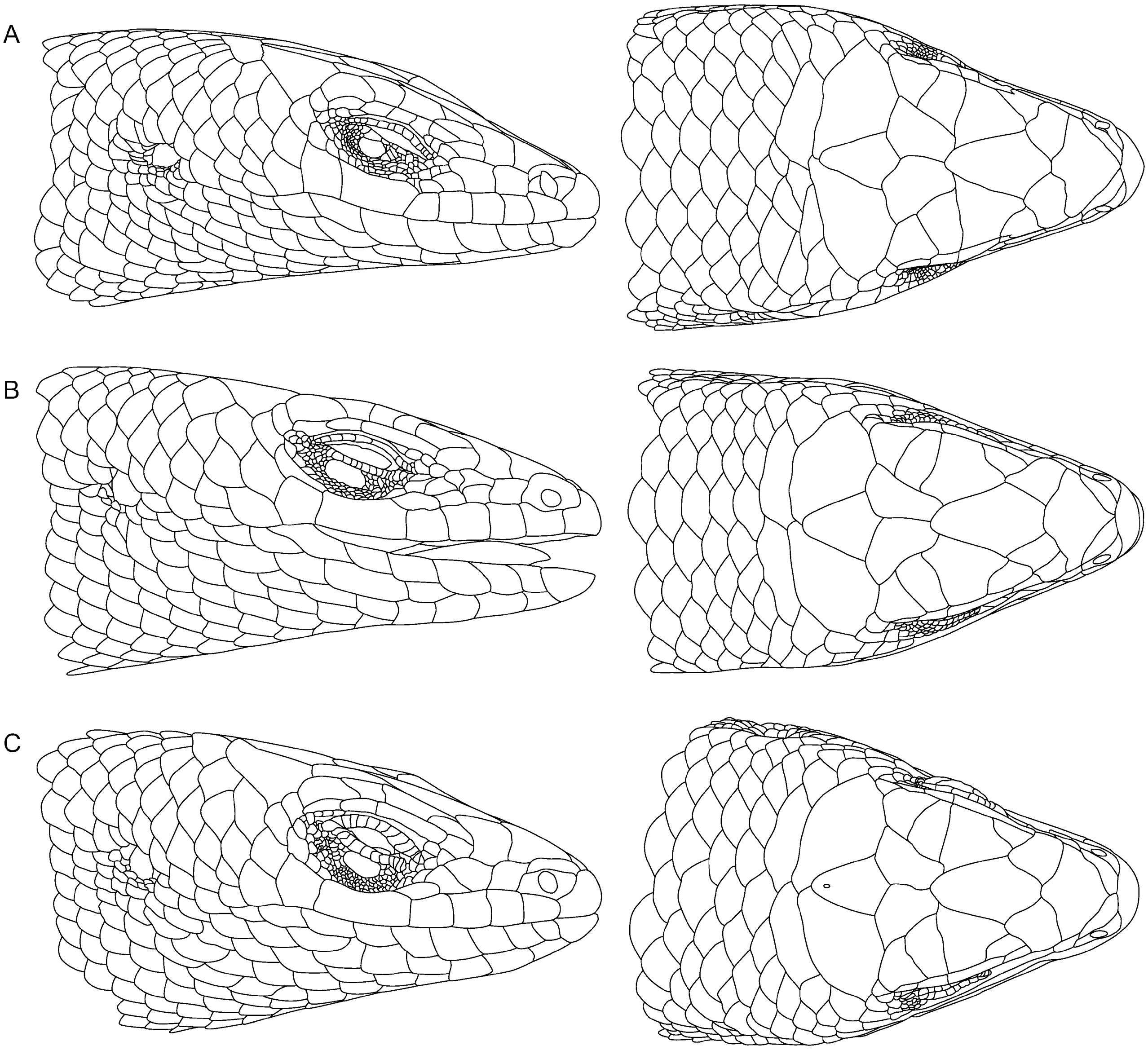

FIGURE 46. Head scalation in species of the Genus *Marisora* (left, side view; right, dorsal view). (A) *M. aurulae* **sp. nov.** (MCZ R-12079, paratype); (B) *M. magnacornae* **sp. nov.** (MCZ R-26976, holotype); and (C) *M. roatanae* **sp. nov.** (TCWC 21955, holotype).

Diagnosis. *Marisora aurulae* **sp. nov.** is characterized by (1) maximum SVL in males, 80.9 mm; (2) maximum SVL in females, 89.0 mm; (3) snout width, 2.47–3.08% SVL; (4) head length, 16.7–19.1% SVL; (5) head width, 13.0–15.0% SVL; (6) ear length, 1.00–2.13% SVL; (7) toe-IV length, 7.96–10.5% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four (85%), five (15%); (11) frontoparietals, two; (12) supralabial below the eye, five (69%), six (31%); (13) nuchal rows, one; (14) dorsals, 57–63; (15) ventrals, 57–68; (16) dorsals + ventrals, 114–129; (17) midbody scale rows, 30–32; (18) finger-IV lamellae, 11–15; (19) toe-IV lamellae, 14–17; (20) finger-IV + toe-IV lamellae, 26–32; (21) supranasal contact, Y (46%), N (54%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Marisora aurulae **sp. nov.** differs from *M. alliacea*, *M. magnacornae* **sp. nov.**, and *M. unimarginata* in having shorter limbs (arm + leg length 53.7–55.9% SVL versus 55.7–69.1% SVL; Fig. 49). From *M. unimarginata* and *M. magnacornae* **sp. nov.** it also differs in having 2–4 pairs of chin shields in contact with the infralabials versus one pair in *M. magnacornae* **sp. nov.** and usually one pair (88%) in *M. unimarginata*. From *M. magnacornae* **sp. nov.** it also differs in having shorter toes (toe-IV length 7.96–10.5% SVL versus 12.4% in *M. magnacornae* **sp. nov.**). *Marisora aurulae* **sp. nov.** is separated from *M. roatanae* **sp. nov.** in having a longer supraciliary-1 scale (1.65–

1.77% SVL versus 1.04–1.29% in *M. roatanae* **sp. nov.**; Fig. 50A). From *M. falconensis*, its closest relative (Figs. 5–7), *M. aurulae* **sp. nov.** differs in having shorter toes (toe-IV length 7.96–10.5% SVL versus 10.8–11.9% in *M. falconensis*; Fig. 50B). Also, most *M. aurulae* **sp. nov.** that we examined (82%) have dark palms and soles and we score that as the fixed state in the species, assuming that the coloration has faded in the remaining 18%. However, *M. falconensis* is considered to have pale palms and soles (Miralles *et al.* 2005a), and thus this may be another diagnostic difference. In body pattern, *M. aurulae* **sp. nov.** differs from all other species in the genus, including *M. falconensis*, in being paler and in having the standard stripe pattern weakly defined or nearly absent (Figs. 47A, and 48). From *M. alliacea* it further differs in lacking dark dorsolateral stripes (present in *M. alliacea*).

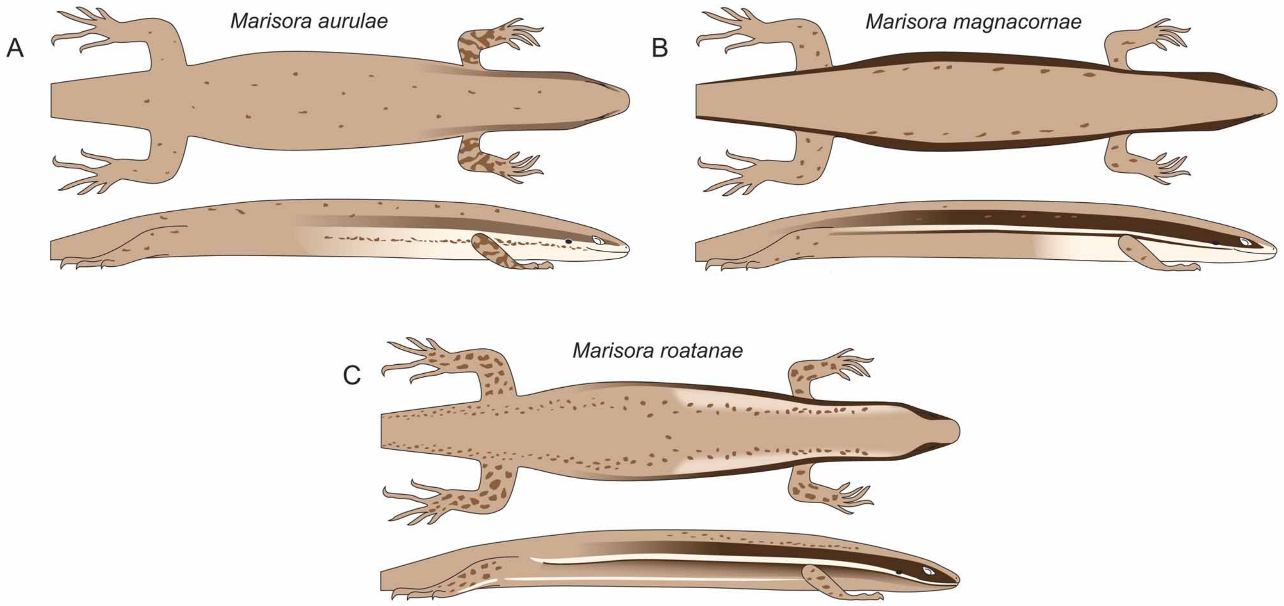

FIGURE 47. Representative patterns in species of the Genus *Marisora* (top, dorsal view; bottom, side view). (A) *M. aurulae* **sp. nov.**; (B) *M. magnacornae* **sp. nov.**; and (C) *M. roatanae* **sp. nov.**

Marisora aurulae **sp. nov.** also differs in many ways from a sympatric species, *Copeoglossum aurae* **sp. nov.**, described above, in the genus *Copeoglossum*. Two scale characters that may be used to separate them readily are parietal scales (not in contact, or rarely just touching, in *C. aurae* **sp. nov.**; in contact in *M. aurulae* **sp. nov.**) and paired chin scales (usually completely separated from infralabials by a row of scales in *C. aurae* **sp. nov.**; 2–4 pairs in contact with infralabials in *M. aurulae* **sp. nov.**).

Description of holotype (Fig. 48A–B). An adult female in good state of preservation, with minor damage to snout tip and with an abdominal slit. SVL 74.6 mm; tail length 32.8 mm (broken and regenerated); HL 13.9 mm; HW 10.5 mm; SW 2.30 mm; EL 1.11 mm; and toe-IV length 7.40 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal heptagonal (damaged), wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal roughly octagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal rectangular and posterior loreal squarish with posterodorsal projection on latter. Two upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials (eight on the left). Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields (plus a third left chin shield scale) in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

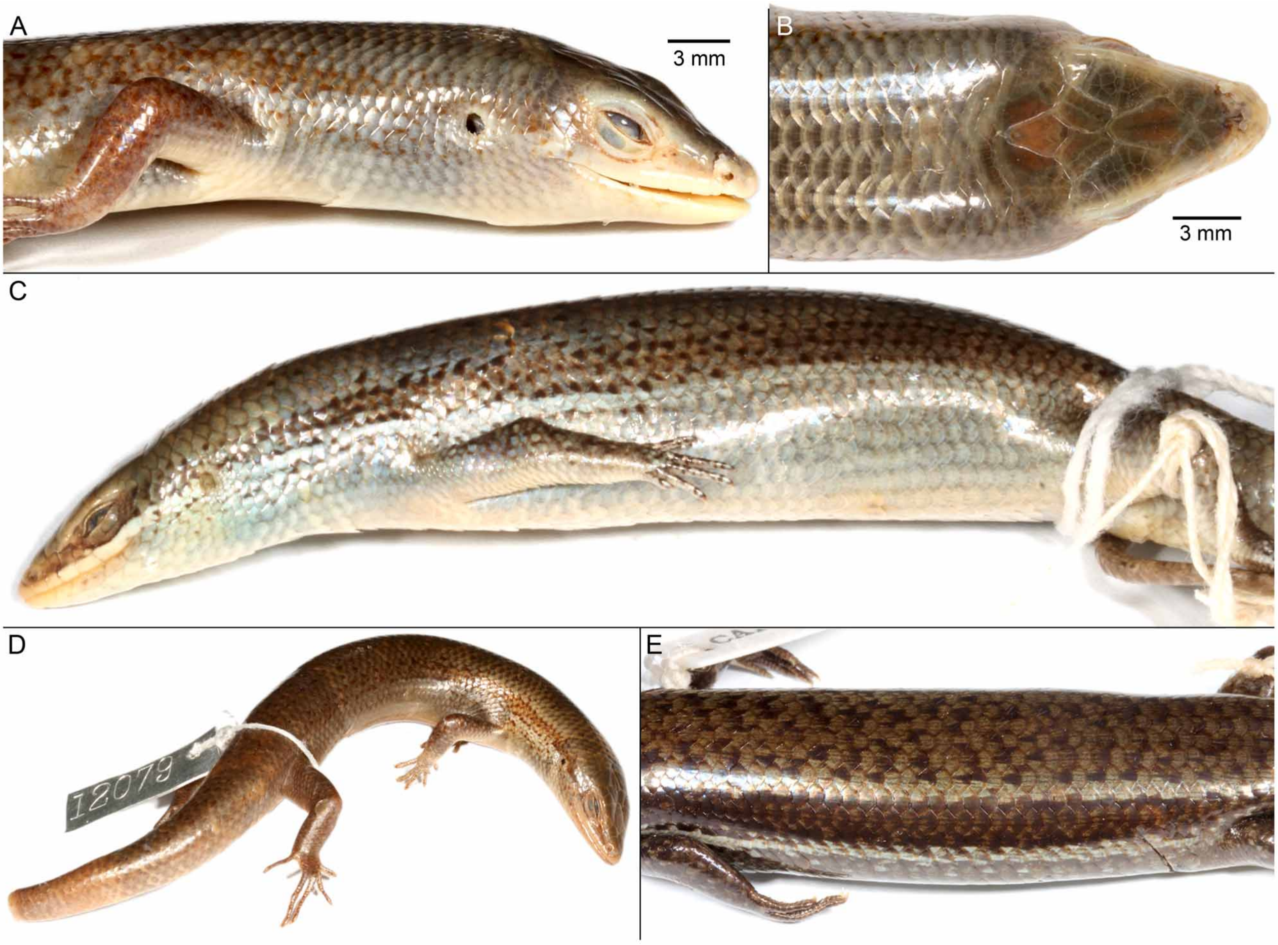

FIGURE 48. *Marisora aurulae* **sp. nov.**, from the Lesser Antilles: (A–B) MCZ R-38196, holotype, Young's Island, St. Vincent; (C) MCZ R-79098, paratype, Carriacou, Grenadines; (D) MCZ R-12079, Tobago (no specific locality). *Marisora falconensis*, from Venezuela: (E) CM 7985, Sucre, Elvecia.

Body and limb scalation. One row of nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 64 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs and paler on regenerated part of tail. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 16 under toe-IV. Preanal scales similar to ventrals. Enlarged median subcaudal scales on regenerated part of tail.

Pattern and coloration (faded slightly, apparently from age and preservation): Dorsal ground color medium grayish-brown with small dark brown spots, distributed on body, tail, and limbs. Forelimbs with larger spots or mottling. Dark dorsolateral stripes absent. Dark lateral stripes present, brown, irregular (series of close blotches), gradually fading from loreal region to hindlimbs. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes present, whitish, extending from behind eye to midbody, bordered below by a series of brown spots. Ventral surface of body without pattern. Palmar and plantar surfaces pale brown or medium brown. No information is available on color in life of the holotype.

Variation. In coloration, most specimens resembled the holotype, except that some specimens had regions just above the dark lateral stripes that were paler than the dorsal ground color (Table 5).

Distribution. The species is distributed in the southern Lesser Antilles and on Trinidad and Tobago. Specifically, it occurs on Young's Island (off St. Vincent), the Grenadines (Mayero Island, Carriacou, and Petit Bateau in the Tobago Cays), Grenada, Trinidad, and Tobago (Fig. 11D, I–J).

Ecology and conservation. Because of confusion between this species and the sympatric species *Copeoglossum aurae* **sp. nov.**, published ecological information on skinks from the region cannot be applied to either species with certainty. Past ecological information reported for skinks from Trinidad and Tobago, summarized in Murphy (1997), probably confounds *C. aurae* **sp. nov.** and *Marisora aurulae* **sp. nov.** In those reports, skinks were noted as occurring in a diversity of habitats, including rainforest, forest edge, coconut trash, and cultivated and disturbed areas. In the Grenadines, skinks have been found usually on the ground "in woody underbrush and between cacti" and climbing among cacti and on tree trunks (Daudin & de Silva 2007). Apparently this species, and *C. aurae* **sp. nov.**, have been extirpated from the large islands of St. Vincent and Grenada (Barbour 1937), both of which have the introduced mongoose. The mongoose is present on Trinidad, although *C. aurae* **sp. nov.** has been collected there in recent years (Murphy 1997); it may have adapted to continental mammalian predators on that island. Photographs of that species confirm its recent presence in the Grenadines (Fig. 25D). However, the last date of collection for *M. aurulae* **sp. nov.** on any island, from material we examined, was 1967 (Trinidad), although two specimens from Tobago (ZFMK 62602–03), not examined here, were collected more recently. Black rats (*Rattus rattus*) are also likely predators, and these are on many islands. We identified more than twice as many specimens in museums of *C. aurae* **sp. nov.** than of *M. aurulae* **sp. nov.**, suggesting that *M. aurulae* **sp. nov.**, over the years, has been less frequently collected (for whatever reasons) than *C. aurae* **sp. nov.**

Based on IUCN Redlist criteria (IUCN 2011), and considering that this species has not been seen on any island within its range (except Tobago, which is mongoose-free) in nearly a half-century, we assess the conservation status of *Marisora aurulae* **sp. nov.** as Critically Endangered (CR A2ace). It faces a primary threat from the introduced mongoose, which has apparently led to its extirpation from Grenada and Trinidad, and near-extinction. A secondary threat is predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*aurulae*) is a feminine genitive singular noun, from the Latin noun *aurula* (small wind, breeze) alluding to both its smaller size (compared with sympatric *Copeoglossum aurae* **sp. nov.**) and its distribution on the Windward Islands: the southern Lesser Antilles, sometimes including Trinidad and Tobago (see Etymology of *C. aurae* **sp. nov.** for further comments on the term "windward"). The first part of the common name (Lesser Windward Skink) refers to the smaller body size of this species, compared with *C. aurae* **sp. nov.** (Greater Windward Skink), described above.

Remarks. There are no records of this species from mainland St. Vincent, but it likely occurred there, prior to the introduction of the mongoose, given its occurrence on the satellite islet, Young's Island. The USNM specimens from Belmont, Grenada, have no date or collector. However, they appear to be from the 19th century because the catalog number immediately preceding those numbers is from 1885, and the assigned name ("*Mabuya aurata*") is one used at about that time (Boulenger 1887). Therefore, there are no definite records of this species on the main island of Grenada subsequent to the introduction of the mongoose.

Marisora aurulae **sp. nov.**, like *Copeoglossum aurae* **sp. nov.**, violates a common pattern of Caribbean island skinks in its occurrence on multiple islands separated by deep water. Most other species are single island (or island bank) endemics. In fact, *M. aurulae* **sp. nov.** has a nearly identical distribution as that of *C. aurae* **sp. nov.**, with both species being taken together at two localities (see discussion above, in Remarks for *C. aurae* **sp. nov.**). Literature reports of skinks on these islands (e.g., Murphy 1997) confuse the two species, and therefore the precise ecological habits of each species remain to be determined. The photo of a skink from near Arima, Trinidad (Murphy 1997) is of *C. aurae* **sp. nov.** (as opposed to *M. aurulae* **sp. nov.**) because it shows separated parietal scales. The molecular phylogeny (Fig. 5) indicates that the closest relative of *M. aurulae* **sp. nov.** is the Venezuelan species *M. falconensis*, as was shown earlier (Miralles *et al.* 2009b). This makes sense from a geographic standpoint, as *M. falconensis* is the closest species to *M. aurulae* **sp. nov.** (in our limited examination of *M. falconensis*, there appeared to be substantial variation, warranting a review of that species). Presumably, the ancestor of *M. aurulae* **sp. nov.** evolved in isolation on Trinidad and Tobago in the Pleistocene, dispersing to the

Lesser Antilles on flotsam carried by ocean currents known to flow in a southeast to northwest direction (Hedges 1996b). The systematic evidence indicates that neither of the two species (*C. aurae* **sp. nov.** and *M. aurulae* **sp. nov.**) was introduced by humans to these islands (see discussion in Remarks for *C. aurae* **sp. nov.**).

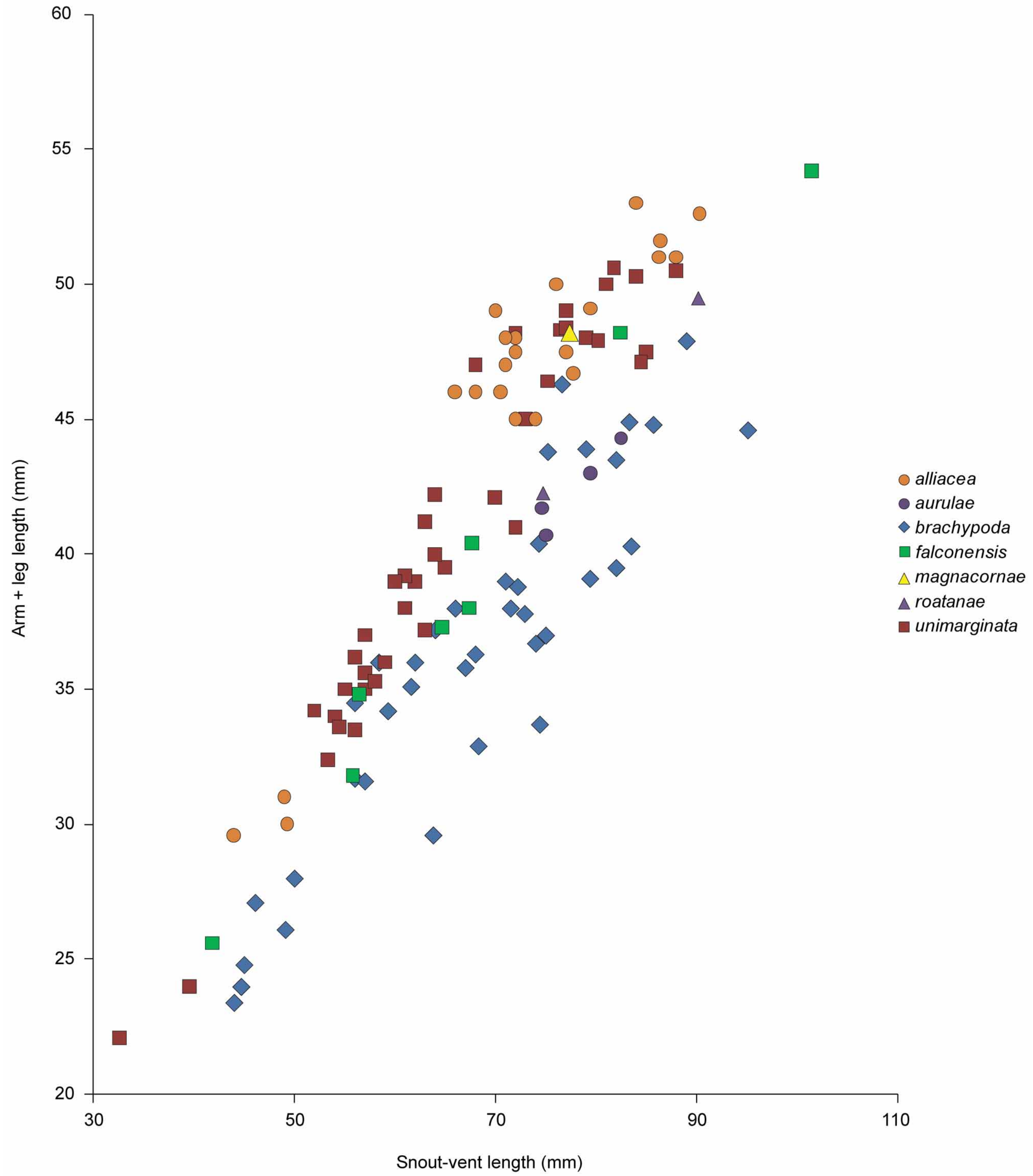

FIGURE 49. Graph of arm + leg length versus snout-vent length in the seven species of the Genus *Marisora*. Measurements from Taylor (1956) were included.

Marisora aurulae **sp. nov.** exhibits some geographic variation. Three specimens from Tobago (MCZ R-12079–80, 55668) differ from all other *M. aurulae* **sp. nov.** in having a higher number of midbody scale rows: 31–32 (n = 3) versus 30 (n = 9). The Glover Island, Grenada specimen (MCZ R-79473) has fewer dorsals + ventrals (114) than others (119–129). However, all are otherwise similar in coloration and scalation to other *M. aurulae* **sp.**

nov. A fifth specimen, the oldest museum specimen of the species (MCZ R-4514), deserves special comment. It was collected in Grenada (no specific locality indicated) and apparently donated to the MCZ in ca. 1882 by P. Sellinan, who deposited some other reptiles in the MCZ collection. One of those reptiles was later described as an endemic subspecies of snake from Grenada (Greer 1965), and the others are consistent with an origin on Grenada, inferring that the skink (MCZ R-4514) from Sellinan is likely from Grenada. However, that specimen differs in several characters from other *M. aurulae* **sp. nov.**: it has the lowest dorsals + ventrals count (111), lacks parietal contact, has the longest toe-IV (11.4% SVL), and has a pattern more like *C. aurae* **sp. nov.** Nonetheless, its other scale characters, including chin scale configuration, are consistent with *M. aurulae* **sp. nov.** and not *C. aurae* **sp. nov.** It is also curious that the other specimen with a low dorsals + ventrals count (MCZ R-79743) was collected in Grenada (Glover Island) as well; however, that specimen agrees more with *M. aurulae* **sp. nov.** in other characters. Whether MCZ-R-4514 represents a geographic variant, a cryptic species, or a hybrid with sympatric *C. aurae* **sp. nov.** is unknown. The specimens from Tobago (ZFMK 62602–03) identified as *M. falconensis* by Miralles *et al.* (2009), although not examined here, are assumed to be *M. aurulae* **sp. nov.**

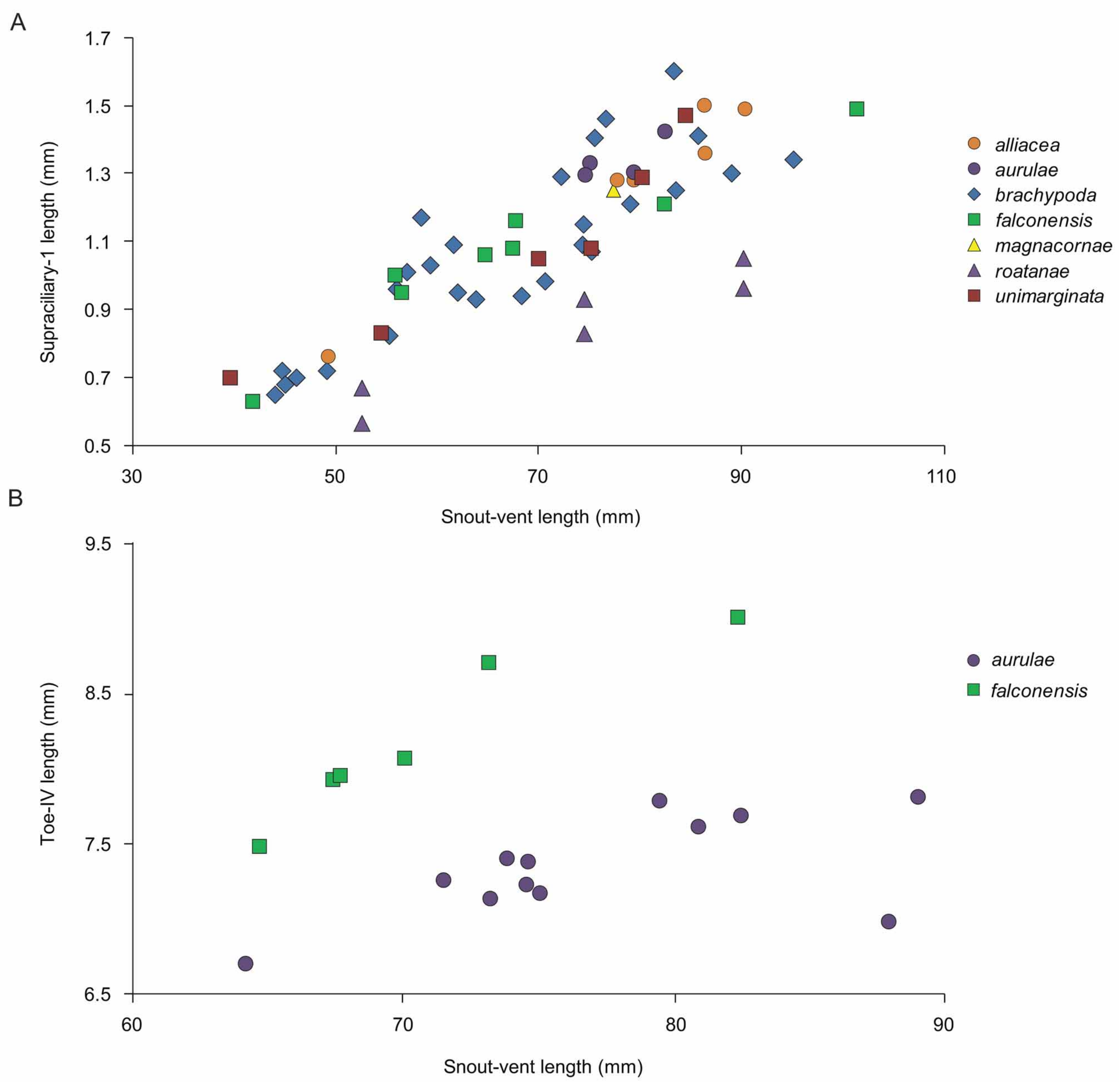

FIGURE 50. Graphs of scalation differences among species of the Genus *Marisora*. (A) Graph of supraciliary-1 length versus snout-vent length in seven species. Measurements are shown for both sides of the head in *M. roatanae* **sp. nov.** (B) Graph of toe-IV length versus snout-vent length in *M. aurulae* **sp. nov.** and *M. falconensis*. Both species are represented by males and females.

One specimen, ZMH R09305, labeled as "*Mabuya agilis*" from St. Thomas, was collected in 1877 by "Riise." It is a member of the genus *Marisora* (not known from the Greater Antilles) and agrees in all respects (scalation and pattern) with *Marisora aurulae* **sp. nov.** Because of the essentially pre-mongoose date of collection, the specific locality, and the collector—Albert Heinrich Riise, a Danish pharmacist and naturalist on St. Thomas—we were intrigued by this specimen and at first considered that it might represent an endemic species to St. Thomas. However, when we discovered that another ZMH specimen (ZMH R09298) with identical catalog information turned out to be the Jamaican species, *Spondylurus fulgidus*, we realized there was likely some confusion in collection data of these specimens. Because the mongoose has significantly altered the diversity of Mabuyinae on Caribbean islands, we could not completely dismiss the possibility that the collection data are correct and that St. Thomas was previously inhabited by *fulgidus*-like and *aurulae*-like species. However, we were unable to find any unique traits in these specimens that would suggest that they were endemic to St. Thomas. Because of this apparent locality confusion we did not treat this specimen as a paratype.

Marisora magnacornae sp. nov.
Corn Island Skink
(Figs. 46B, 47B, 51)

Mabuya agilis—Barbour & Loveridge, 1929:142 (part).
Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya brachypodus—Taylor, 1956:308 (part).
Mabuya brachypoda—Webb, 1958:1311 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya unimarginata—Villa *et al*., 1988:54 (part).
Mabuya brachypoda—Campbell, 1998:167 (part).
Mabuya unimarginata—Lee, 1996:247 (part).
Mabuya unimarginata—Savage, 2002:503 (part).

Holotype. MCZ R-26976, an adult male collected between 10 December 1927 and 3 January 1928 on Great Corn Island, Nicaragua by James L. Peters (Peters 1929).

Diagnosis. *Marisora magnacornae* **sp. nov.** is characterized by (1) maximum SVL in males, 77.4 mm; (2) maximum SVL in females, not available; (3) snout width, 2.71% SVL; (4) head length, 18.6% SVL; (5) head width, 14.0% SVL; (6) ear length, 1.36% SVL; (7) toe-IV length, 12.4% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, one; (14) dorsals, 57; (15) ventrals, 60; (16) dorsals + ventrals, 117; (17) midbody scale rows, 30; (18) finger-IV lamellae, 12; (19) toe-IV lamellae, 17; (20) finger-IV + toe-IV lamellae, 29; (21) supranasal contact, Y; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Marisora magnacornae **sp. nov.** differs from all other species in the Genus *Marisora* in having a longer toe-IV (12.4% SVL versus 7.96–11.9% in other species except *M. brachypoda*; 7.43–12.2% SVL in 89% of that species). It also differs from individual species in other characters. The limbs of *M. magnacornae* **sp. nov.** are longer than most species (arm + leg length 62.3% SVL), and in this character it differs from *M. aurulae* **sp. nov.** (53.7–55.9% SVL), *M. brachypoda* (45.3–61.7% SVL), *M. falconensis* (53.5–61.6% SVL), and *M. roatanae* **sp. nov.** (54.5–56.2% SVL; Fig. 49). *Marisora magnacornae* **sp. nov.** also differs in having fewer dorsals + ventrals (117) than *M. roatanae* **sp. nov.** (122–125). From *M. alliacea* it differs in having 30 midbody scale rows (versus 26–29) and in lacking dark dorsolateral stripes (present in *M. alliacea*). From *M. roatanae* **sp. nov.** it additionally differs in having 30 midbody scale rows (versus 32), a relatively longer supraciliary-1 scale (1.61% SVL versus 1.04–1.29%; Fig. 50A), and absence of pale ventrolateral stripes. From *M. unimarginata* it differs in having two pairs (versus one pair) of chin shields in contact with the infralabials, a narrower pale lateral stripe (1.10% SVL versus 1.43–1.89%) and in having the pale lateral stripe passing through the lower half of the ear opening (that stripe passes through all or most of the ear opening in *M. unimarginata*).

Description of holotype (Figs. 46B, 51). An adult male in excellent state of preservation, without injuries and without an abdominal slit. SVL 77.4 mm; tail length 23.8 mm (broken); HL 14.4 mm; HW 10.8 mm; SW 2.10 mm;

EL 1.05 mm; and toe-IV length 9.59 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

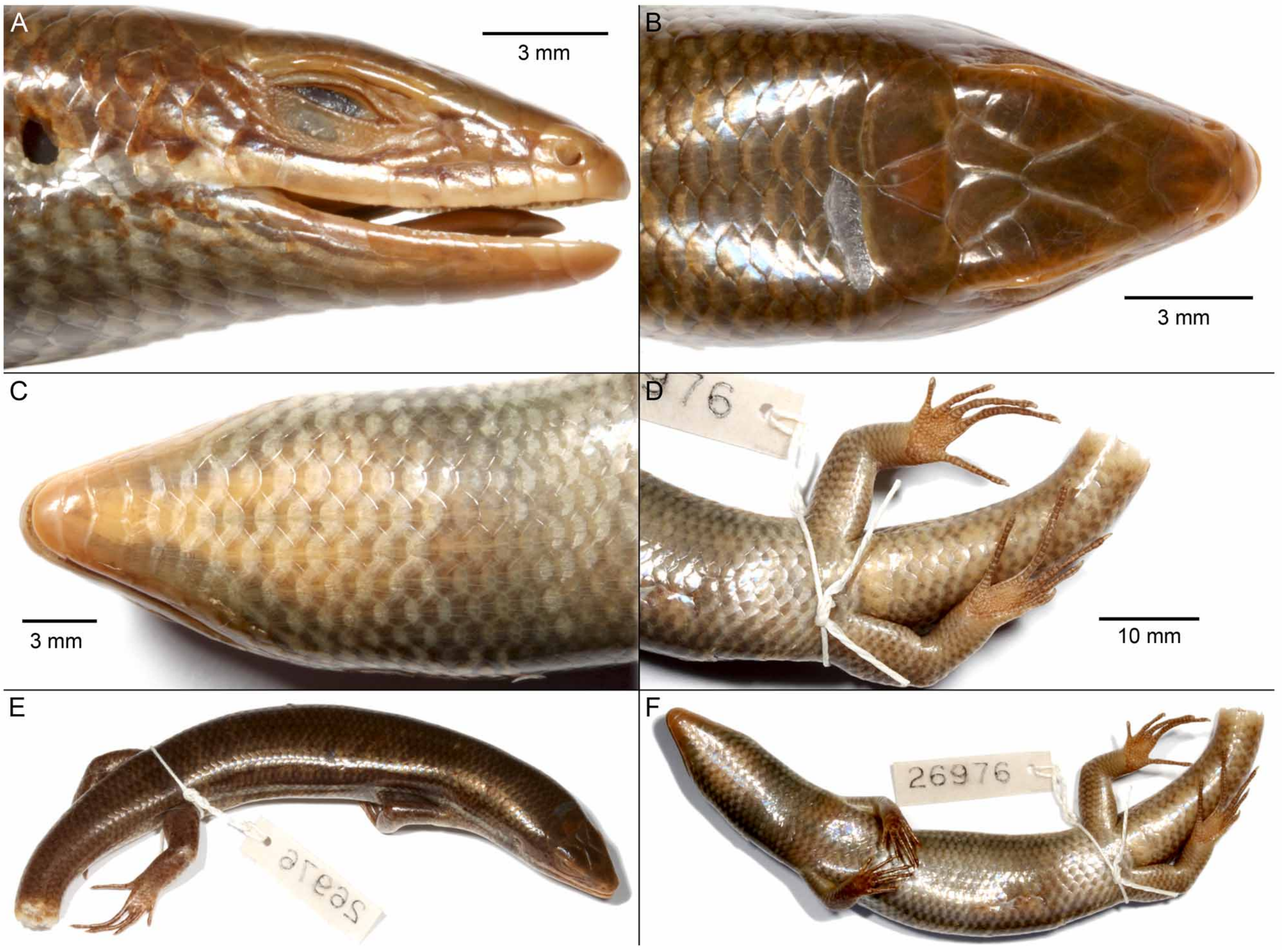

FIGURE 51. *Marisora magnacornae* **sp. nov.**, from Great Corn Island, Nicaragua. (A–F) MCZ R-26976, holotype, Great Corn Island (no specific locality).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal on the left. Frontonasal heptagonal, wider than long, laterally in contact with anterior loreal scale on the left. On the right, a small scale is present between the frontonasal and anterior loreal. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal, and first supralabial. Anterior loreal rectangular and posterior loreal squarish with posterodorsal projection on latter. Three upper preoculars (four on the left) and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 57 in a longitudinal row; ventrals similar to dorsals; 60 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 12 under finger-IV and 17 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brown with small dark brown spots, distributed uniformly and in two dorsolateral bands on body, in broken lines on tail, and uniformly on limbs. Dark dorsolateral stripes absent. Dark lateral stripes present, extending from loreal region past hindlimbs and onto base of tail. Pale middorsal stripe absent. Pale dorsolateral stripes absent. Pale lateral stripes present, pale gray, extending from behind eye past hindlimbs, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color in life of the holotype.

Variation. No other specimens are known. Measurements and other morphological data for the holotype are presented in Tables 3–5.

Distribution. The species is distributed on Great Corn Island (10 km^2), Nicaragua (Fig. 1), located approximately 50 km from the Nicaraguan coast. The precise locality on Great Corn Island where the holotype was collected is unknown, and therefore no map is shown here. It is also unknown whether it or a related species occurs on Little Corn Island (2.9 km^2).

Ecology and conservation. No information is available in the original account of the expedition except that the species is called "slitch" by the islanders (Barbour & Loveridge 1929). The only known specimen of the species was collected nearly a century ago. Recent photographs of this small island show some forest present (apparently unprotected), as well as roads, an airport, settlements, and farm animals. It can be assumed that rats are present, and these may pose the most significant threat to this species.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Marisora magnacornae* **sp. nov.** as Endangered (EN A2ace). It faces a primary threat from predation by introduced mammals, including black rats, and a secondary threat from habitat alteration. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, if the species still exists.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*magnacornae*) is a feminine genitive singular noun, referring to the island on which the species occurs. Although formally called Great Corn Island, it is usually called simply "Corn Island," and hence the English common name, Corn Island Skink. The language of Nicaragua is Spanish, but the Corn Islands were named by the British, and the government of Nicaragua maintains the English name as the official name for the islands. Hence we use that English name as a stem for the species name.

Remarks. Although *Marisora magnacornae* **sp. nov.** has unique scale characters that distinguish it from other species, it is not particularly distinctive in pattern, and it probably was medium brown in life with dark brown markings. *Marisora magnacornae* **sp. nov.** and *M. unimarginata* have the longest limbs in the genus, in contrast to geographically proximal *M. brachypoda* (short limbs). No specimens of *M. unimarginata* are yet known from adjacent Nicaragua or eastern Coast Rica. However, two specimens of *Marisora brachypoda* from eastern Nicaragua, USNM 19872–73, are unusual in having a mixture of characters (long limbs, two pairs of chin shields in contact with infralabials, long toe-IV (11.2–12.7% SVL), and 30 midbody scale rows) that combined distinguish them from other species. They may represent aberrant specimens of *M. magnacornae* **sp. nov.**, or of other species such as *M. brachypoda* or *M. unimarginata*, or they may represent an undescribed species.

Marisora magnacornae **sp. nov.** may have arisen as a vicariant relict of an ancestral species (a close relative of *M. unimarginata*) that was more widely distributed during Pleistocene glaciations when low sea levels exposed the continental shelf. Alternatively, it may have rafted to the island at some point in the past, presumably from points south (e.g., Panama) or east based on ocean currents in that portion of the Caribbean. The highest elevation on the island is approximately 110 m, which would have meant that some land would have been emergent during Pleistocene interglacial high stands, assuming that no geological uplift has since occurred.

Marisora roatanae sp. nov.
Roatán Skink
(Figs. 46C, 47C, 52)

Mabuya mabouya mabouya—Dunn, 1936:544 (part).
Mabuya brachypodus—Taylor, 1956:308 (part).
Mabuya brachypoda—Webb, 1958:1311 (part).
Mabuya mabouya mabouya—Peters & Donoso-Barros, 1970:200 (part).
Mabuya mabouya—Wilson & Hahn, 1973:116 (part).
Mabuya unimarginata—Villa *et al.*, 1988:54 (part).
Mabuya brachypoda—Campbell, 1998:167 (part).
Mabuya unimarginata—Lee, 1996:247 (part).
Mabuya unimarginata—Savage, 2002:503 (part).
Mabuya unimarginata—McCranie *et al.*, 2005:114 (part).

Holotype. TCWC 21955, an adult female from Jonesville, Isla de Roatán, Islas de la Bahía, Honduras, 3 m, collected on 11 April 1965 (collector unknown).

Paratype (n = 1). Isla de Roatán, Honduras. UTA R55232, an adult male from Oak Ridge, Isla de Roatán, Islas de la Bahía, Honduras (collected by Gary Ferguson in 1979).

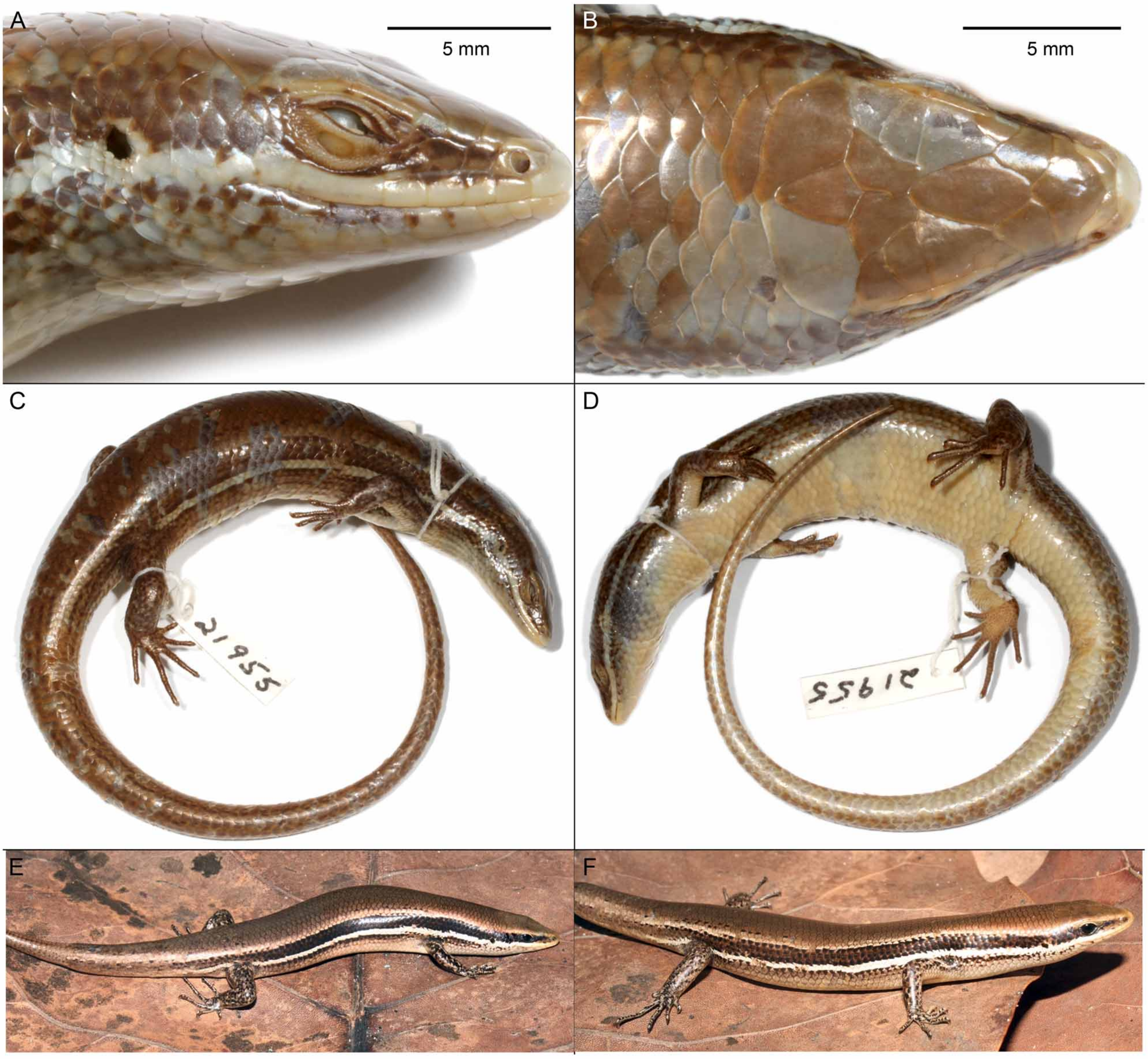

FIGURE 52. *Marisora roatanae* **sp. nov.**, from Roatán Island, Islas de la Bahía, Honduras. (A–D) TCWC 21955, holotype, Jonesville. (E–F) uncataloged, live individuals photographed by James R. McCranie.

Other material. Isla de Roatán, Honduras. Uncataloged, Politilly Bight (east side), Isla de Roatán, Islas de la Bahía, Honduras, collected on 16 November 2010 by Stesha Pasachnik (only images of this third specimen were available; no character data were taken).

Diagnosis. *Marisora roatanae* **sp. nov.** is characterized by (1) maximum SVL in males, 74.7 mm; (2) maximum SVL in females, 90.2 mm; (3) snout width, 2.38–2.96% SVL; (4) head length, 15.7–19.0% SVL; (5) head width, 12.6–14.1% SVL; (6) ear length, 0.95–1.15% SVL; (7) toe-IV length, 8.39–10.5% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four (67%), five (33%); (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, one; (14) dorsals, 57–58; (15) ventrals, 65–67; (16) dorsals + ventrals, 122–125; (17) midbody scale rows, 32; (18) finger-IV lamellae, 13–15; (19) toe-IV lamellae, 15–18; (20) finger-IV + toe-IV lamellae, 28–33; (21) supranasal contact, Y; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (33%), N (67%); (24) parietal contact, Y; (25) pale middorsal stripe, N; (26) dark dorsolateral stripe, N; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Marisora roatanae **sp. nov.** differs from all other species in the Genus *Marisora* in having a small supraciliary-1 scale (1.04–1.29% SVL versus 1.35–2.00% in other species; Fig. 50A). It also differs from individual species in other characters. From *M. alliacea*, it differs in having shorter limbs (arm + leg length, 54.9–56.2% SVL versus 58.0–70.0%; Fig. 49), more midbody scale rows (32 versus 26–29), more dorsals plus ventrals (122–125 versus 113–121), and no dark dorsolateral stripes (present in *M. alliacea*). From *M. unimarginata*, it differs in having two pairs of chin shields in contact with infralabials (versus usually one pair). From *M. magnacornae* **sp. nov.**, it differs in having short limbs (arm + leg length 54.9–56.2% SVL versus 62.3%; Fig. 49), more midbody scale rows (32 versus 30), and more dorsals plus ventrals (122–125 versus 117 in *M. magnacornae* **sp. nov.**).

Marisora roatanae **sp. nov.** is most closely related to *M. brachypoda* (Fig. 5). From *M. brachypoda*, it differs in having more midbody scale rows (32 versus 28–30 in *M. brachypoda*). One of the 36 *M. brachypoda* examined, from Guanacaste, Costa Rica (TCWC 80536), has 32 midbody scale rows, although this specimen from Guanacaste may represent an undescribed species (see Remarks for *Marisora*) and therefore has been removed from summary counts for that species. *Marisora roatanae* **sp. nov.** also has small ear openings (0.95–1.15% SVL; both ears of both specimens) compared with *M. brachypoda* (1.22–2.18% SVL; Fig. 53). The holotype of *M. roatanae* **sp. nov.** also has unusually small eyelid windows (1.36–1.37% SVL versus 1.50–2.82% in other species of *Marisora*), although the paratype has more normal eyelid windows (1.79–1.85% SVL). Specimens of *M. brachypoda* from neighboring islands of Utila and Guanaja have supraciliary-1 scales, midbody scale counts, and ear lengths typical of *M. brachypoda*.

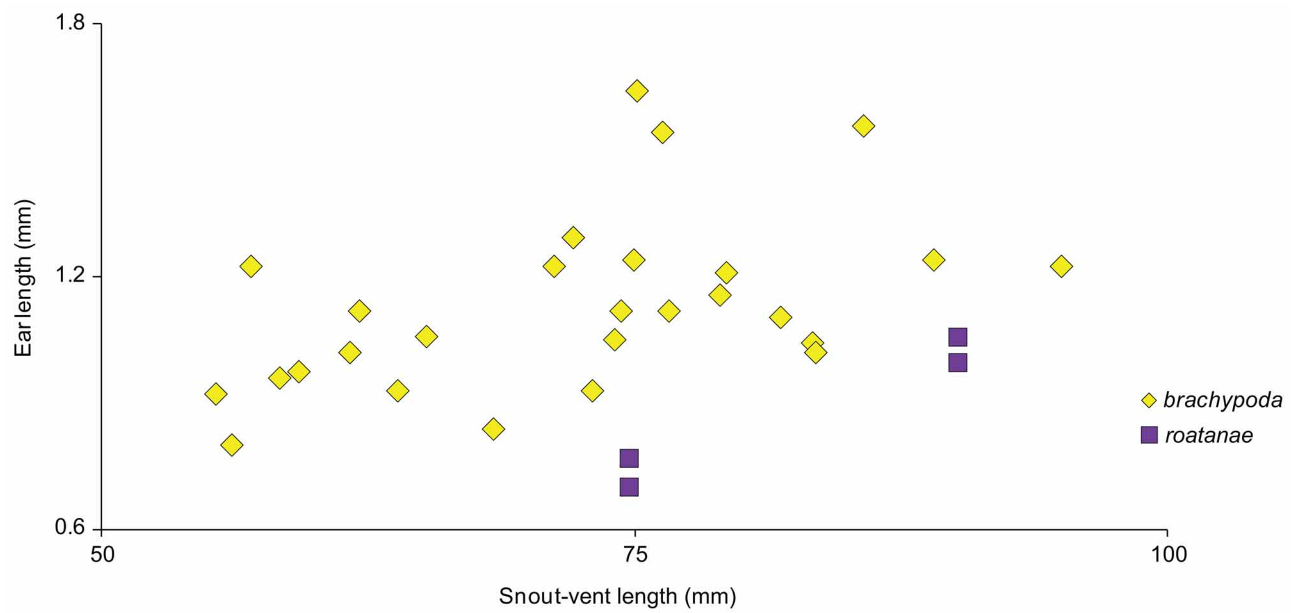

FIGURE 53. Graph of ear length versus snout-vent length in *Marisora brachypoda* and *M. roatanae* **sp. nov.** Measurements are shown for both sides of the head in *M. roatanae* **sp. nov.**

Two recently collected, uncataloged, specimens of *Marisora roatanae* **sp. nov.** (James R. McCranie, personal communication) agree with the type and paratype in having > 30 midbody scale rows (one has 32 and the other has 31 or 32 midbody scale rows). That character separates *M. roatanae* **sp. nov.** from other Middle American species (*M. alliacea*, *M. brachypoda*, and *M. magnacornae* **sp. nov.**), which have 26–30 midbody scale rows, except *M. unimarginata* from lower Middle America (28–32 rows) and a possible new species from Costa Rica with 32 rows (see Remarks for *Marisora*).

In pattern *Marisora roatanae* **sp. nov.** has the basic elements of *Marisora* (wide, dark lateral stripe above a narrow, pale lateral stripe) but differs from other species of the genus in having a mostly unspotted, gray-brown dorsum in life. Base (dorsal zone) coloration, in life, in *M. brachypoda* and other species usually is tan, coppery brown, or reddish-brown with more spotting, and in some cases (*M. alliacea*), dorsolateral stripes. The pale ventrolateral stripes that extend onto the hindlimbs of *M. roatanae* **sp. nov.** (Fig. 47C) are distinctive in the holotype (but not in the paratype) and absent in nearly all other preserved specimens of *Marisora* except some *M. brachypoda* from Honduras (TCWC 19211–12; CM 63581–87); in those cases they are less well-developed and do not extend onto the hindlimbs.

Description of holotype (Figs. 46C, 52A–D). An adult female in good state of preservation, without injuries and with an abdominal slit. SVL 90.2 mm; tail length 145.0 mm (complete); HL 14.2 mm; HW 11.4 mm; SW 2.15 mm; EL 1.43 mm; and toe-IV length 7.57 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal decagonal, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posterodorsal projection on latter. Three upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

Body and limb scalation. One row of nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 67 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 15 under toe-IV. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. In preservative: Dorsal ground color medium brown with relatively few dark brown spots, distributed in two dorsolateral zones on body, in discontinuous stripes on tail, and uniformly on limbs. Dark dorsolateral stripes absent. Dark lateral stripes present, dark brown, extending from loreal region past hindlimbs. Pale middorsal stripe absent. Pale dorsolateral stripes present between bands of dorsolateral dark spots and dark lateral stripes. Two pale ventrolateral stripes present, whitish, extending from below eye to last third of body (upper stripe continues past hindlimbs and lower stripe continues onto hindlimbs), each bordered below by a dark line. Forelimbs and hindlimbs with large dark spots. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information is available on color in life of the holotype.

Variation. The pattern elements in the paratype and in Specimen PB are similar to those in the holotype, although the ventrolateral stripe is less strongly developed in those specimens. The middorsal zone (base color) of the paratype and Specimen PB is medium gray-brown rather than the coppery, tan, or reddish-brown color (in life) typical of other species of the Genus *Marisora*, although that difference may not be significant. Different preservatives (e.g., formalin versus ethanol) tend to alter coloration in different ways, and therefore subtle differences in coloration among preserved specimens, and especially between preserved and unpreserved specimens, should be interpreted cautiously.

Distribution. The species is distributed on Isla de Roatán, Islas de la Bahía, Honduras (Fig. 9E), located approximately 60 km from the north coast of Honduras. All three specimens are from a relatively small region in central Roatán.

Ecology and conservation. No published information is available. Ecological information on mabuyine skinks from Utila and Guanaja (McCranie *et al.* 2005) pertains to *Marisora brachypoda*. Specimen PB was found recently killed on a road. Forest habitats on Roatán, in practice, are not protected, although some areas are designated as "protected" (S. Pasachnik, personal communication). Deforestation continues for agriculture and commercial development. Rats are present on the island. Besides the two museum specimens, two Roatán skinks were found in 2011 (James R. McCranie, personal communication) and another two (Specimen PB and another near Jonesville) were sighted during a long term field survey of iguanian lizards on Roatán (S. Pasachnik, personal communication). This suggests unnaturally low abundance compared with other island populations of skinks (e.g., Caicos Islands and Dominica) where the mongoose does not occur.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *M. roatanae* **sp. nov.** to be Endangered (EN A2ace). It faces a primary threat from predation by introduced mammals, including black rats. Studies are needed to determine the health of the remaining populations, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*roatanae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Roatán.

Remarks. The short limbs and chin shield configuration of *Marisora roatanae* **sp. nov.**, and its possession of ventrolateral stripes, agree more with *M. brachypoda* than *M. unimarginata*, suggesting that *M. roatanae* **sp. nov.** and *M. brachypoda* are closest relatives. Such a relationship is also consistent with geography. *Marisora roatanae* **sp. nov.** and *Marisora brachypoda*-3 from Honduras have a moderately low sequence divergence (0.8%; Fig. 6) and their time of divergence is estimated to be 0.6 Ma (Fig. 7), similar to the divergence of a currently recognized species from the Virgin Islands (*Spondylurus macleani*) and its closest relatives, and between other diagnosable species in the Genus *Spondylurus* (Figs. 5–7). The lower sequence divergence of *M. roatanae* **sp. nov.** and *M. brachypoda* in Fig. 5, on the other hand, is artifactual because the two Honduras specimens of *M. brachypoda* (samples 2–3) lack some fast-evolving mitochondrial sequences (16S rRNA in both, cyt b in one).

Roatán is the largest of the Bay Islands of Honduras and has several other endemic reptiles (Barbour 1928; McCranie *et al.* 2005). Bathymetry maps indicate that the island is separated from mainland Honduras by deeper water than other Bay islands such as Utila, and hence it was probably isolated for a longer time when sea levels rose following Pleistocene glaciation events.

Genus *Notomabuya* gen. nov.

Southern Neotropical Skinks

Type species. *Emoea frenata* Cope, 1862:187.

Diagnosis. The species in this genus is characterized by (1) frontoparietals, one, (2) supraciliaries, 4–6, (3) supraoculars, 4 (rarely three or five), (4) prefrontal contact, absent or rare, (5) parietal contact, present (or rarely no contact), (6) rows of nuchals, one, (7) dorsals + ventrals, 111–130, (8) total lamellae, 217–228, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. The maximum SVL in this species is 91 mm (Vrcibradic & Rocha 2011) (Table 2).

The presence of one frontoparietal separates this genus from all others except *Aspronema* (1–2 frontoparietals), *Exila*, and *Panopa*. From *Exila* and *Panopa*, it differs by having one row of nuchals (versus 2–5 in those other genera). In lacking dark dorsolateral stripes, it is separated from *Aspronema*, *Manciola*, *Orosaura*, *Panopa*, *Psychosaura*, *Spondylurus* and *Varzea* (except rarely). In lacking a dark middorsal stripe, it is separated from *Aspronema* and *Manciola*. In having pale palms and soles, it differs from *Capitellum*, *Exila*, *Mabuya*, *Maracaiba*, *Orosaura*, and *Psychosaura* (dark palms and soles).

Content. One species is placed in this genus: *Notomabuya frenata* (Table 1).

Distribution. This genus occurs in Argentina, Bolivia, Brazil, and Paraguay (Fig. 8B).

Etymology. The generic name (*Notomabuya*) is a feminine noun derived from the Greek *notos* (south, southern) and *mabuya* (a Neotropical skink), hence "Southern Neotropical Skink," in allusion to the distribution of the included species (*frenata*) in southern South America.

Remarks. The molecular phylogeny (Fig. 5) shows each of the four samples of *Notomabuya frenata*, from diverse localities in Brazil, clustering together in a monophyletic group but with long branch lengths, as was shown by earlier studies (Whiting *et al.* 2006; Miralles *et al.* 2009b). Sequence divergence among those four populations (3.4–11%; Fig. 6) is greater than among some recognized species elsewhere in the tree, indicating that *Notomabuya frenata* is likely a complex of species.

Genus *Orosaura* gen. nov.

Venezuelan Mountain Skinks

Type species. *Mabuya nebulosylvestris* Miralles *et al.*, 2009:603.

Diagnosis. The species in this genus is characterized by (1) frontoparietals, two, (2) supraciliaries, four (rarely five or six), (3) supraoculars, four, (4) prefrontal contact, absent or rare, (5) parietal contact, present (or rarely no contact), (6) rows of nuchals, one, (7) dorsals + ventrals, unavailable (48–56 dorsals and 27–38 ventrals, counted by a different method; Miralles *et al.* 2009), (8) total lamellae, unavailable, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, unknown (see Remarks), (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. The maximum body size for this species is 97 mm SVL (Table 2).

The presence of two frontoparietals (unfused) separates *Orosaura* from *Exila*, *Notomabuya*, and *Panopa* (one frontoparietal). The presence (versus absence) of dark lateral stripes distinguishes this genus from *Alinea*. From *Capitellum* (5–6 supraciliaries), *Orosaura* differs in having four supraciliaries (rarely 5–6). From *Copeoglossum*, *Orosaura* differs by having parietal contact (versus usually no contact) and a higher number of dorsals + ventrals (127 versus 105–120). In having four supraoculars, *Orosaura* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). The presence of a single nuchal row separates this genus from *Exila* and *Panopa* (2–5 nuchal rows) and from most *Spondylurus* (usually 2–3 rows, rarely one). *Orosaura* also differs from *Spondylurus* in having poorly-defined dorsolateral dark and pale stripes (well-defined in *Spondylurus*). *Orosaura* differs from *Psychosaura* in having a typical mabuyine head shape (subacuminate) versus a prominent, acuminate head shape in *Psychosaura*. From *Aspronema* and *Manciola* it differs in lacking a dark middorsal stripe. *Orosaura* has what appears to be a pair of irregular, dark nape stripes or lines of spots immediately adjacent to the pale dorsolateral stripes (Miralles *et al.* 2009) whereas this pattern is lacking in *Maracaiba* and *Marisora*. From *Brasiliscincus*, *Manciola*, *Notomabuya*, and nearly all species of *Spondylurus*, it differs by having dark (versus pale) palms and soles. In its large maximum body size (to 97 mm SVL) it differs from *Aspronema*, *Capitellum*, *Exila*, *Panopa*, and *Psychosaura* (all < 86 mm SVL).

Content. One species is placed in this genus: *Orosaura nebulosylvestris* (Table 1).

Distribution. This genus is distributed in Northern Venezuela, in the northernmost Andes (Cordillera de Mérida) and in the central portion of the Venezuelan Coastal Range, at elevations of 920–2360 m.

Etymology. The generic name (*Orosaura*) is a feminine noun derived from the Greek *oro* (mountain) and *saura* (lizard), referring to the distribution of the genus in the mountains of northern Venezuela.

Remarks. Miralles *et al.* (2009) discussed the distribution and elevational limits in this species and others. We do not have experience with it and rely on the original description. Miralles *et al.* (2009: figs. 1–2) highlighted the presence of dark dorsolateral stripes as a diagnostic trait in *Orosaura nebulosylvestris*, and they are indicated in the their line drawing but are not visible in the photograph of a live individual in that article (see also Remarks for *Maracaiba* regarding differences in the scoring of stripes). For internal consistency, we have omitted dorsolateral stripe information for this genus in Table 2. Phylogenetically, this clade is well-defined (Fig. 5) but more information on scalation and pattern variation in *Orosaura* would be welcome, to better define it morphologically.

Genus *Panopa* gen. nov.

Venezuelan Blue-tailed Skinks

Type species. *Mabuya croizati* Horton, 1973:75.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, one, (2) supraciliaries, 4–6, (3) supraoculars, four, (4) prefrontal contact, present (a single, fused prefrontal), (5) parietal contact, present, (6) rows of nuchals, usually 3–5, (7) dorsals + ventrals, 115–126, (8) total lamellae, 191–209, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, present, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. They are intermediately sized, with a range of maximum body sizes among the species of 69–76 mm SVL (Table 2).

The presence of a single (fused) frontoparietal scale separates *Panopa* from all other genera (two, or rarely three frontoparietals) except *Aspronema* (1–2 scales) and *Exila* and *Notomabuya* (one scale). The presence of prefrontal contact or fusion separates *Panopa* from *Brasiliscincus*, *Capitellum*, *Notomabuya*, and *Psychosaura* (no prefrontal contact) and from *Alinea*, *Aspronema*, *Copeoglossum*, *Mabuya*, *Manciola*, *Maracaiba*, and *Marisora* (no or rare contact). The presence of 3–5 rows of nuchals separates *Panopa* from all other genera (fewer than three rows) except *Alinea* (1–3 rows), *Exila* (2–3 rows), and *Spondylurus* (1–3 rows). *Panopa* also have blue tails in juveniles and adults. The only other mabuyines known to have blue tails are *Spondylurus lineolatus* of Hispaniola (juveniles and adults) and *S. powelli* **sp. nov.** (juveniles only).

Content. Two species are placed in this genus: *Panopa carvalhoi* and *P. croizati* (Table 1).

Distribution. The genus is distributed in two isolated regions: in northeastern Venezuela and in southern Venezuela (Amazonas) and adjoining northern Brazil (Roraima; Fig. 8B).

Etymology. The generic name (*Panopa*) is a feminine noun and is derived from the Greek adjective *pan* (whole, undivided) and noun *lopas* (flat plate), in allusion to the single (fused) frontoparietal scale.

Remarks. This pair of species shares a suite of morphological traits (Miralles *et al.* 2005a), and they cluster together in molecular phylogenies (Fig. 5; Miralles *et al.* 2009b).

Genus *Psychosaura* gen. nov.

Brazilian Sharp-nosed Skinks

Type species. *Mabuya macrorhyncha* Hoge, 1946:241.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 4–5, (3) supraoculars, four, (4) prefrontal contact, absent, (5) parietal contact, present, (6) rows of nuchals, 1–2, (7) dorsals + ventrals, 114 in one specimen of *P. macrorhyncha* scored by us (50–58 dorsals and 33–38 ventrals, counted by a different method; Rodrigues *et al.* 2000), (8) total lamellae, 201, (9) dark middorsal stripe, absent, (10) dark dorsolateral stripes, present, (11) dark lateral stripe, present, and (12) dark ventral striping, absent. They are intermediate in size, with a range of maximum body sizes among the species of 74–85 mm (Vrcibradic & Rocha 2011) (Table 2).

The presence of dark dorsolateral stripes separates *Psychosaura* from *Alinea*, *Capitellum*, *Copeoglossum*, *Exila*, *Maracaiba*, and *Notomabuya* (dark dorsolateral stripes absent). In several other genera (*Mabuya*, *Marisora*, and *Varzea*), dark dorsolateral stripes are usually absent as well. It differs from *Aspronema*, *Brasiliscincus*, *Capitellum*, and *Manciola* by having a higher number of total lamellae (201 versus 147–194 in those other species). From *Aspronema* and *Manciola*, it is distinguished by the absence of a narrow dark middorsal stripe. It differs from *Exila*, *Notomabuya*, and *Panopa* by having two (versus one) frontoparietals. It differs from *Exila* and *Panopa* in lacking prefrontal contact (versus prefrontals in contact or fused). *Psychosaura* also differs from *Panopa* in having 1–2 rows of nuchals versus 3–5 rows. It differs from *Orosaura* (97 mm maximum SVL) in being slightly smaller (74–85 mm maximum SVL) and in having a prominent head. In having dark palms and soles, *Psychosaura* differs from *Brasiliscincus*, *Manciola*, *Notomabuya*, and most *Spondylurus* (pale palms and soles, except *S. caicosae* **sp. nov.**, *S. fulgidus*, and *S. lineolatus*).

Content. Two species are placed in this genus: *Psychosaura agmosticha* and *P. macrorhyncha* (Table 1).

Distribution. This genus is distributed in eastern Brazil (Rodrigues 2000; Fig. 8B).

Etymology. The generic name (*Psychosaura*) is a feminine noun from the Greek *psyche* (mind) and *saura* (lizard), meaning "thinking lizard," in allusion to the prominent heads, gracile bodies, and agile, active habits of the species.

Remarks. Rodrigues (2000) summarized information on the two species placed here in *Psychosaura*. He separated them from all other South American Mabuyinae (except those placed here in *Panopa*) as having a "prominent head," although he did not present snout or head length measurements. The two included species cluster strongly (100% bootstrap support) in the tree (Fig. 5), although the position of the lineage with respect to other genera is not well-established. *Psychosaura macrorhyncha* (and presumably *P. agmosticha*) is more scansorial than other species (Vrcibradic & Rocha 1996) and this habit is often correlated with species having gracile bodies, long limbs, long digits, and long, pointed snouts. Other species with this ecology and morphology include *Panopa carvalhoi*, *P. croizati*, *Alinea pergravis* and *Spondylurus fulgidus*.

Genus *Spondylurus* Fitzinger, 1826

Antillean Four-lined Skinks

Spondylurus Fitzinger, 1826:23. Type species: *Scincus sloanii* Daudin, 1803:287, by monotypy.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two (very rarely one or three), (2) supraciliaries, four (occasionally three, five, or six; three commonly in *Spondylurus lineolatus* and five always in *S. fulgidus*), (3) supraoculars, four (three commonly in *S. martinae* **sp. nov.** and *S. monitae* **sp. nov** and two or three rarely in six other species), (4) prefrontal contact, absent (contact or not in *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. powelli* **sp. nov.**, and *S. sloanii*, and contact rarely in three other species), (5) parietal contact, present (rarely no contact in three species), (6) rows of nuchals, two (rarely one or three), (7) dorsals + ventrals, 108–135, (8) total lamellae, 159–238, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, present, (11) a dark lateral stripe, present, and (12) dark ventral striping, absent. Species range from small to large in maximum body sizes, 64–107 mm SVL (Table 2).

The presence of dark dorsolateral stripes separates *Spondylurus* from *Alinea*, *Capitellum*, *Copeoglossum*, *Exila*, *Maracaiba*, and *Notomabuya* (dark dorsolateral stripes absent). In several other genera (*Mabuya*, *Marisora*, and *Varzea*), dark dorsolateral stripes are usually absent as well. From *Aspronema* and *Manciola*, it is distinguished by the absence of a narrow dark middorsal stripe. It differs from *Exila*, *Notomabuya*, and *Panopa* (one frontoparietal) by having two frontoparietals (very rarely one or three). It differs from *Exila* and *Panopa* in lacking prefrontal contact (versus prefrontals in contact or fused). *Spondylurus* usually have two rows of nuchals (rarely one or three) and all species have some individuals with more than one row; this differs from *Brasiliscincus*, *Capitellum*, *Copeoglossum*, *Manciola*, *Maracaiba*, *Notomabuya*, *Orosaura*, and *Varzea* (only one row of nuchals). In having mostly pale palms and soles (except *S. caicosae* **sp. nov.**, *S. fulgidus*, and *S. lineolatus*), *Spondylurus* differs from *Capitellum*, *Exila*, *Mabuya*, *Maracaiba*, *Orosaura*, and *Psychosaura* (dark palms and soles).

Content. Seventeen species are placed in the genus: *Spondylurus anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. semitaeniatus*, *S. sloanii*, *S. spilonotus*, and *S. turksae* **sp. nov.** (Table 1).

Distribution. The genus is distributed in the northern portion of the West Indies, including the Turks and Caicos Islands, Jamaica, Hispaniola, the Puerto Rico Bank and region (including Mona, Monito, and the U.S. and British Virgin Islands), and on islands of the Anguilla Bank in the northern Lesser Antilles (Anguilla, St. Martin, and St. Barts); Figs. 1, 8A, 9A–C, 10, and 11A.

Etymology. The etymology was not given in the original description. However, the generic name (Fitzinger 1826) is masculine and probably derived from the Latin noun *spondylos* (vertebra), in allusion to the distinctive pale middorsal (vertebral) stripe in the type species (also present in most other species of the genus), or to dark dorsolateral (paravertebral) stripes that help define the pale middorsal stripe, or both. We give this genus the common name "Antillean four-lined skinks" in reference to the four major dark stripes (lateral and dorsolateral) most readily observed, ignoring the much thinner dark ventrolateral stripes.

Remarks. Three species are currently recognized, nine new species are described here, and four older species names are resurrected. Specimens of the nine new species described below have been in collections since at least the early 20th century but were considered to represent either a single subspecies, "*Mabuya mabouya sloanei*" (Dunn 1936) or a single species, "*Mabuya sloanii*" (Miralles 2005; Miralles *et al.* 2009b) by previous revisers of Caribbean island skinks. In his description of *Spondylurus*, Fitzinger (1826) noted that *Spondylurus sloanii* differs from other skinks in having femoral pores, but this statement is in error; it does not have femoral pores, as was noted subsequently by several authors. We place these 17 species of *Spondylurus* in seven species groups (see Discussion).

***Spondylurus anegadae* sp. nov.**

Anegada Skink
(Fig. 54A, 55A, 56)

Mabuya sloanii—Grant, 1937:520 (part).
Mabuya mabouya—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:33 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya—Maclean, 1982:36 (part).
Mabuya sloanei—Lazell, 1983:104 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Perry & Gerber, 2006:244 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. UMMZ 80583, an adult female, collected 6 April 1936 on Anegada (no specific locality), British Virgin Islands, by Chapman Grant.

Paratypes (n = 37). Anegada, British Virgin Islands. MCZ R-42381 and UMMZ 239502–528 (paratopotypes), same collection data as holotype; CM 17357–58, Harry A. Beatty (no additional collection information available); KU 242057, Albert Schwartz, vicinity of The Settlement, 18 August 1964; KU 242058–63, Albert Schwartz, The Settlement, 28 March 1968.

Associated specimens (n = 2). Anegada?, British Virgin Islands. ZMUC-R 759, A. H. Riise, no specific locality, accessioned in 1862; AMNH R99522, Harry A. Beatty, Tortola, East-end Hills (probable locality error, see Remarks), 6 November 1966.

Material not examined (n = 2). Anegada, British Virgin Islands. AMNH R99523–24, “Anegada" (no specific locality), collected by Harry A. Beatty.

Diagnosis. *Spondylurus anegadae* **sp. nov.** is characterized by (1) maximum SVL in males, 67.8 mm; (2) maximum SVL in females, 70.4 mm; (3) snout width, 2.13–3.34% SVL; (4) head length, 15.4–18.6% SVL; (5) head width, 10.7–13.3% SVL; (6) ear length, 0.96–2.10% SVL; (7) toe-IV length, 8.34–10.7% SVL; (8) prefrontals, two (97%), three (3%); (9) supraoculars, four; (10) supraciliaries, four (95%), five (5%); (11) frontoparietals, two; (12) supralabial below the eye, five (76%), six (24%); (13) nuchal rows, one (5%), two (87%), three (8%); (14) dorsals, 58–66; (15) ventrals, 59–70; (16) dorsals + ventrals, 118–133; (17) midbody scale rows, 28–33; (18) finger-IV lamellae, 10–14; (19) toe-IV lamellae, 13–17; (20) finger-IV + toe-IV lamellae, 24–31; (21) supranasal contact, Y; (22) prefrontal contact, Y (3%), N (97%); (23) supraocular-1/frontal contact, Y (45%), N (55%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, N; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. anegadae* **sp. nov.** is separated from all other species except *S. culebrae* **sp. nov.**, *S. lineolatus*, *S. monae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (1.35–3.79 versus 0.115–1.27 in those other species). It differs from *S. caicosae* **sp. nov.**, *S. culebrae* **sp. nov.**, and *S. sloanii* by having essentially no dorsal pattern posterior to the dark dorsolateral stripes (versus dark dorsal spots posterior to the dark dorsolateral stripes in those other species). It is distinguished from *S. fulgidus*, *S. monitae* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having supranasal

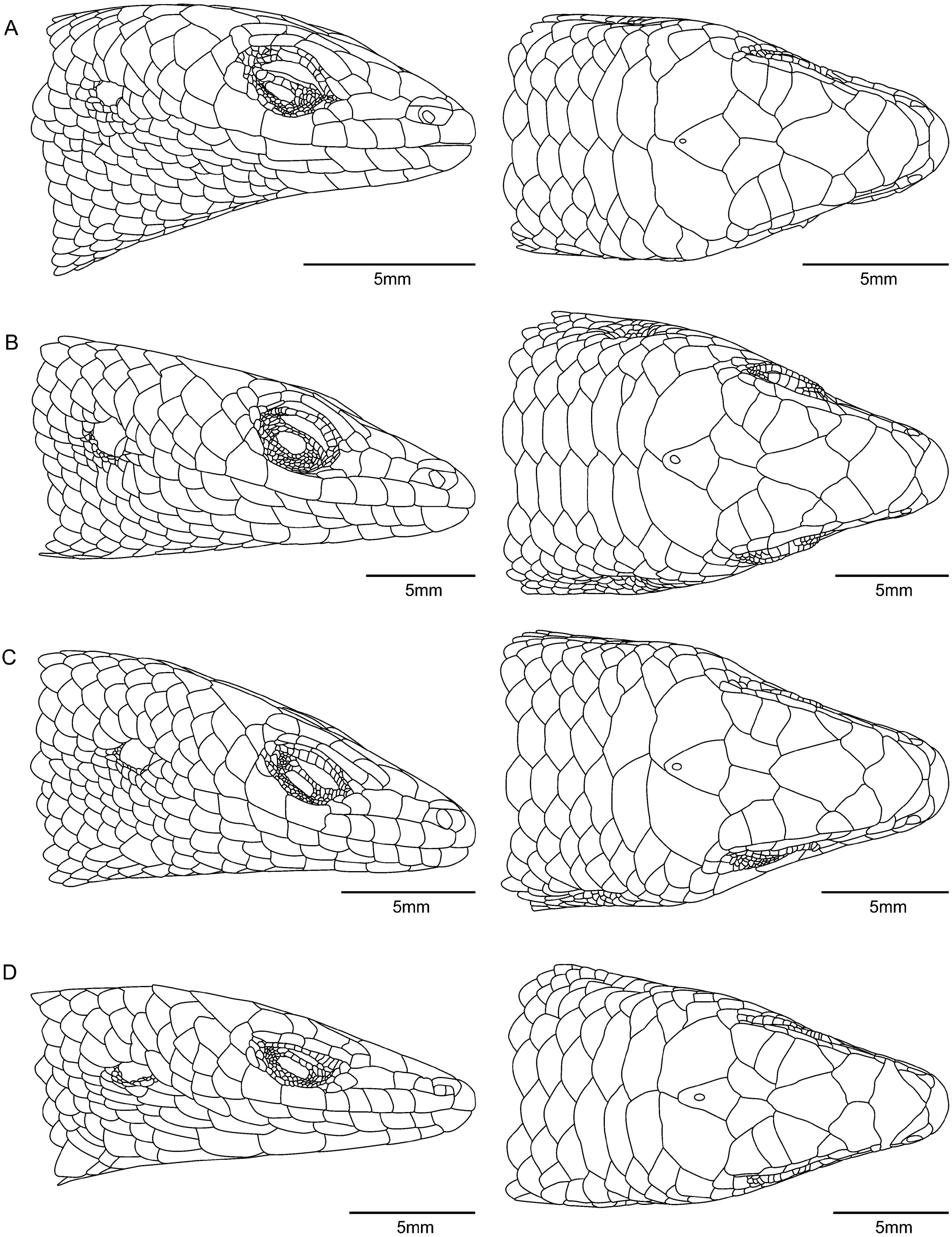

FIGURE 54. Head scalation in species of the Genus *Spondylurus* (left, side view; right, dorsal view). (A) *S. anegadae* **sp. nov.** (UMMZ 80583, holotype); (B) *S. caicosae* **sp. nov.** (AMNH R-80126, holotype); (C) *S. culebrae* **sp. nov.** (UMMZ 73823, holotype); and (D) *S. fulgidus* (UMMZ 85862).

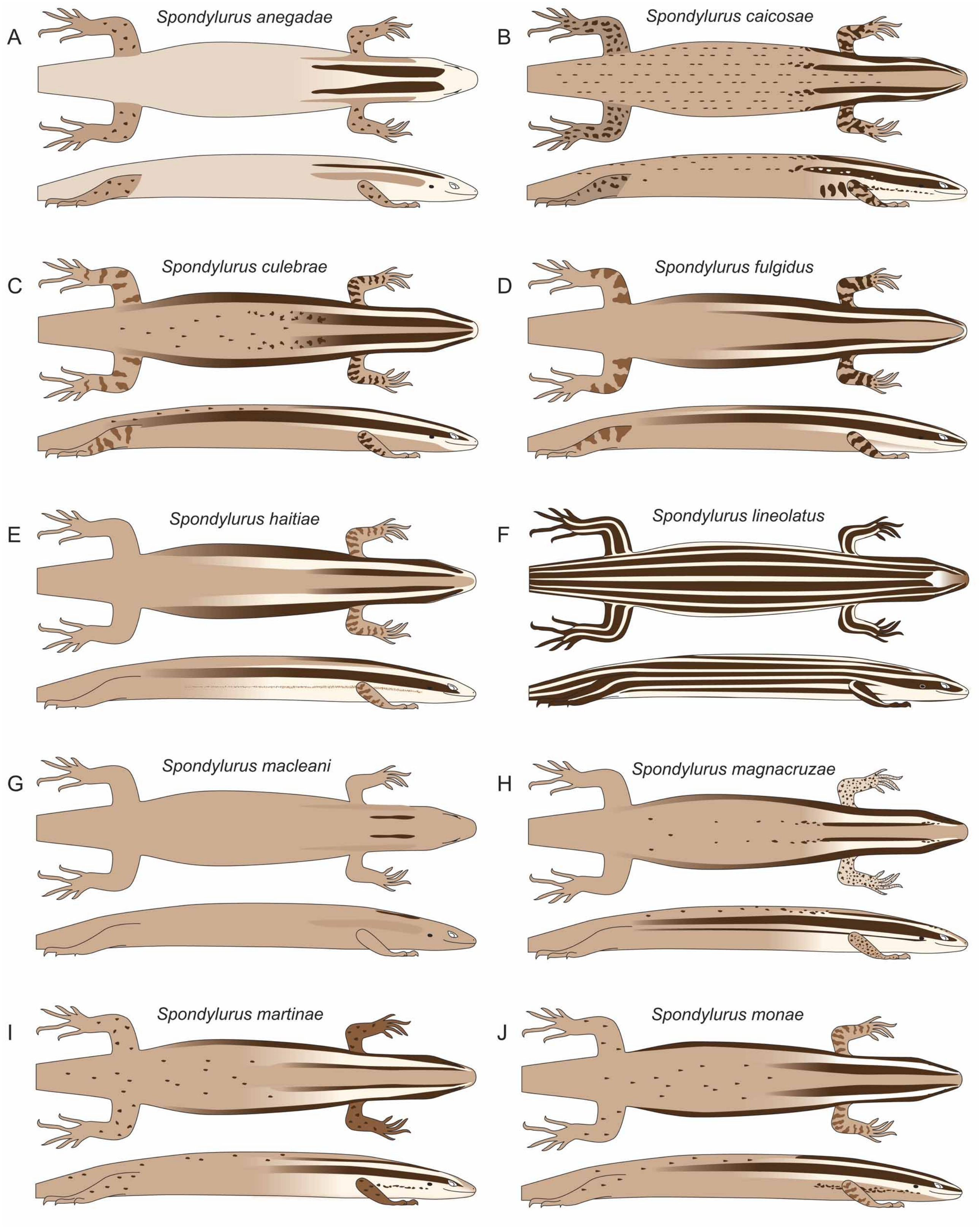

FIGURE 55. Representative patterns in species of the Genus *Spondylurus* (top, dorsal view; bottom, side view). (A) *S. anegadae* **sp. nov.**; (B) *S. caicosae* **sp. nov.**; (C) *S. culebrae* **sp. nov.**; (D) *S. fulgidus*; (E) *S. haitiae* **sp. nov.**; (F) *S. lineolatus*; (G) *S. macleani*; (H) *S. magnacruzae* **sp. nov.**; (I) *S. martinae* **sp. nov.**; and (J) *S. monae* **sp. nov.**

FIGURE 56. *Spondylurus anegadae* **sp. nov.**, from Anegada, British Virgin Islands. (A–C) UMMZ 80583, holotype, Anegada (no specific locality). (D) fetus of UMMZ 239508.

contact (versus no contact in those other species). From *S. magnacruzae* **sp. nov.** and *S. spilonotus*, it is separated by having a lower number of midbody scale rows (28–33 versus 34 in those other species). Compared with *S. culebrae* **sp. nov.** (maximum SVL, 98 mm), *S. anegadae* **sp. nov.** (maximum SVL, 70.4 mm) is much smaller (e.g., Fig. 2) and also differs by a plot of interparietal width versus SVL (Fig. 57). From *S. lineolatus*, it differs by having two dark dorsolateral stripes and two dark lateral stripes (versus 10 dark stripes in *S. lineolatus*) and by having a larger head (head length 15.4–18.6% SVL versus 12.9–14.4% in *S. lineolatus*). *Spondylurus anegadae* **sp. nov.** differs from *S. semitaeniatus* by having a shorter, wider nostril (Fig. 58). It differs from *S. monitae* **sp. nov.** by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales in *S. monitae* **sp. nov.**). In pattern (Fig. 55A), *S. anegadae* **sp. nov.** differs most distinctively from other species in having a pale face (top and side of snout) and dark dorsolateral and lateral stripes that extend only a short distance past the axila and then end abruptly, the dorsolateral stripes being distinctly darker than lateral stripes.

Besides those non-overlapping differences, there are frequency differences that distinguish *Spondylurus anegadae* **sp. nov.** from other species. It differs from *S. fulgidus* by having fewer supraciliaries (four in 95% of specimens versus five in *S. fulgidus*). It is separated from *S. haitiae* **sp. nov.** by having a larger ear (ear length 1.26–2.10% SVL in 88% of specimens versus 1.19% in *S. haitiae* **sp. nov.**). It is distinguished from *S. macleani* by having fewer finger-IV + toe-IV lamellae (24–29 in 86% of specimens versus 30–31 in 80% of specimens belonging to *S. macleani*). It is separated from *S. martinae* **sp. nov.** by having fewer ventral scales (59–67 in 94% of specimens versus 68–71 in *S. martinae* **sp. nov.**). It differs from *S. monae* **sp. nov.** by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (1.82–3.79 in 85% of specimens versus 0.985–1.73 in 89% of specimens belonging to *S. monae* **sp. nov.**). It is distinguished from *S. nitidus* by having a shorter toe-IV (toe-IV length 8.34–10.0% SVL in 81% of specimens versus 10.1–12.7% SVL in 93% of specimens belonging to *S. nitidus*). From *S. powelli* **sp. nov.**, it is separated by having supranasal contact (versus no supranasal contact in 81%

of specimens belonging to *S. powelli* **sp. nov.**). It is separated from *S. sloanii* by lacking prefrontal contact: no contact in 97% of specimens of *S. anegadae* **sp. nov.** versus contact (or near contact; < 0.3% SVL separation of prefrontals), in 74% of specimens belonging to *S. sloanii*). Approximately one-half of *S. anegadae* **sp. nov.** have 30 or fewer midbody scale rows, but other species of the genus *Spondylurus* inhabiting the Virgin Islands (*S. macleani*, *S. magnacruzae* **sp. nov.**, *S. semitaeniatus*, *S. sloanii*, and *S. spilonotus*) all have 31 or more scale rows. Except for *S. lineolatus* and *S. powelli* **sp. nov.**, *Spondylurus anegadae* **sp. nov.** is a smaller species than all others within the Genus *Spondylurus* (maximum adult SVL 70.4 mm versus 77.6–98.8 mm in other species).

Description of holotype (Figs. 54A, 56A–C). An adult female in good state of preservation, without injuries and with an abdominal slit. SVL 67.0 mm; tail length 95.8 mm (complete); HL 10.3 mm; HW 7.16 mm; SW 1.43 mm; EL 1.06 mm; and toe-IV length 5.59 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

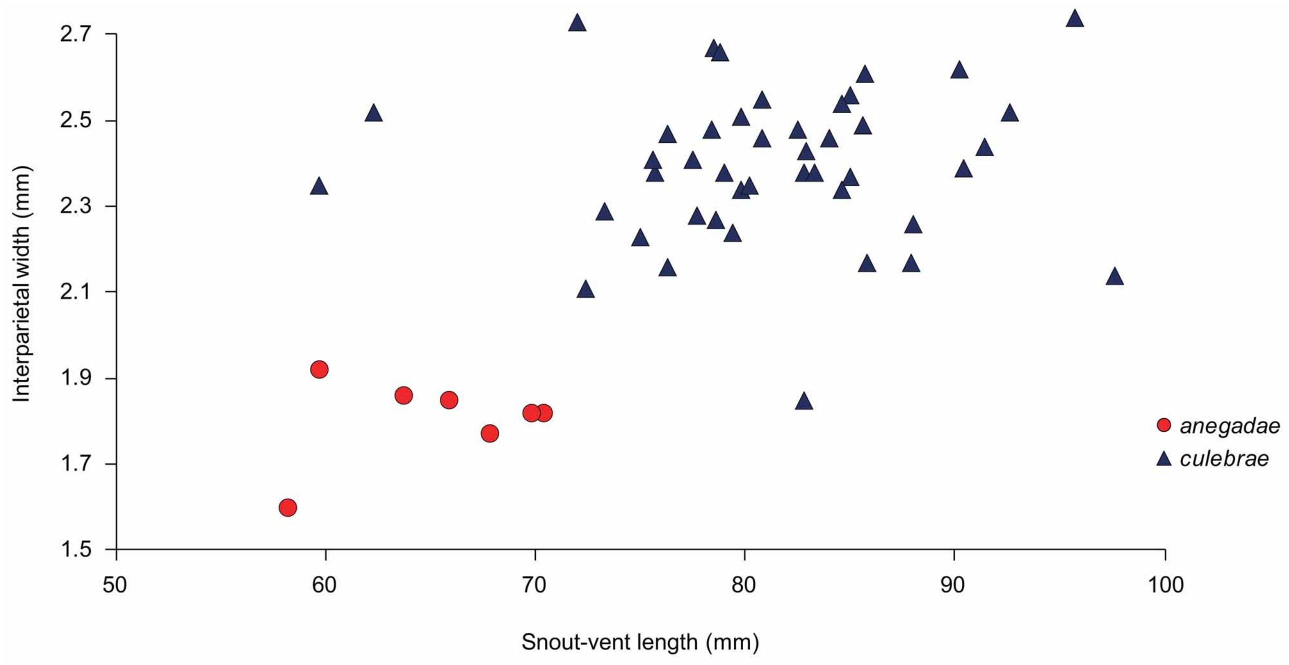

FIGURE 57. Graph of interparietal width versus snout-vent length in two species of the Genus *Spondylurus*.

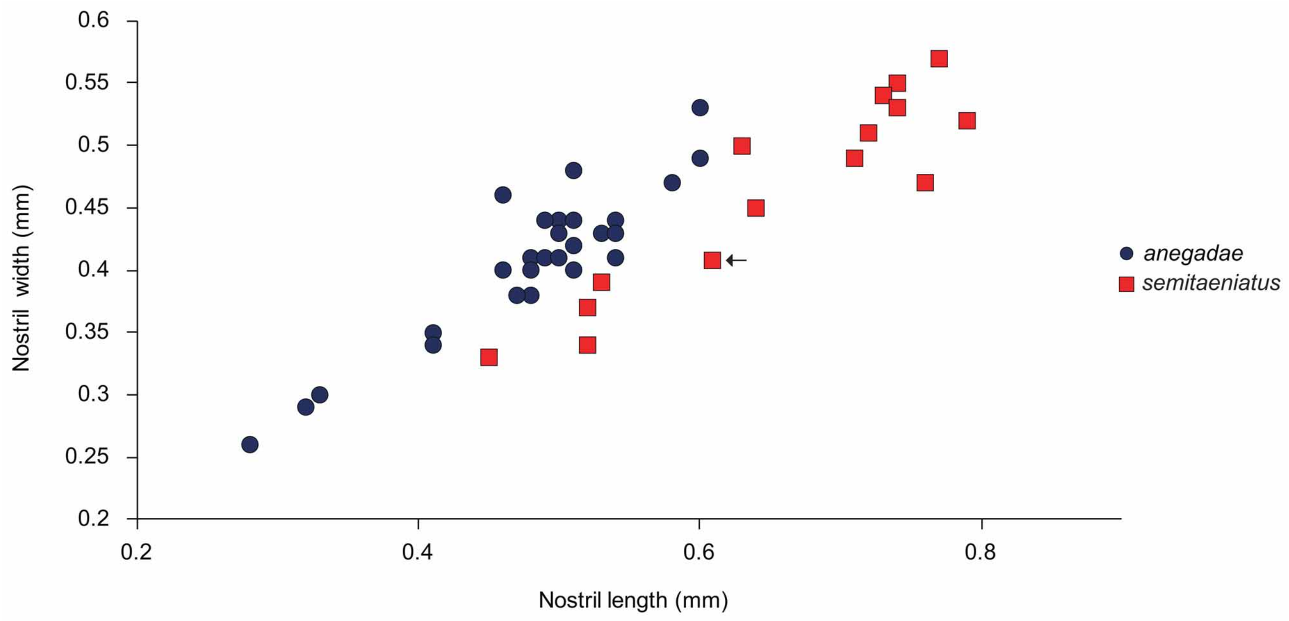

FIGURE 58. Graph of nostril width versus nostril length in two species of the Genus *Spondylurus*. The lectotype of *S. semitaeniatus* is indicated with an arrow.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal tetragonal, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals (fused in holotype), first supraciliary, first supraoculars, and frontal. Frontal heptagonal, elongate, in contact with the first and second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals fused (rectangular) with posterodorsal projection. One upper and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged postocular scales behind eye; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Six infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 64 in a longitudinal row; ventrals similar to dorsals; 64 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 12 under finger-IV and 16 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color pale greenish-gray with only a few small dark spots or flecks, paler on top and sides of head and neck. Dark dorsolateral stripes present, wide (2.13 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, tan, irregular (series of close blotches), extending from behind eye to first third of body. Pale middorsal stripe present, narrow (1.02 mm), bluish-white, extending from top of head to first third of body. Pale dorsolateral stripes present, bluish-white, extending from behind eye to first third of body. Pale lateral stripes absent. Forelimbs and hindlimbs slightly darker brown. Ventral surface of body without pattern except for fine tan flecks (on magnification) giving appearance of a slight gray tinge. Palmar and plantar surfaces unpigmented. No information on color in life is available on the holotype.

Variation. In coloration and scalation, other specimens resembled the holotype (Tables 4–5). Carey (1972) mentioned that color in life was red-brown with a uniform cream venter, and MacLean (1982) noted that the dorsum was "shiny, metallic bronze." In the field notes of Albert Schwartz, KU 242058–061 were described in life as having "head brown; supraorbitals white, extending to tympanum as stripe; infralabials and gular region white. A brown stripe extends back nearly to midbody; also two chocolate stripes beginning on top of head above the eye and extending back nearly to midbody. Dorsum reddish brown; lighter on tail; sides same as dorsum. Venter uniform cream, mid-tail, forelimbs, and hindlimbs slightly darker brown." The greenish tinge of all of the UMMZ specimens contrasts strongly with the absence of any green mentioned for color in life, indicating that the greenish tinge is a preservational artifact.

Distribution. The species is distributed on Anegada, British Virgin Islands (Fig. 10F) (Carey 1972; MacLean *et al.* 1977; MacLean 1982; Lazell 1983; Schwartz & Henderson 1991; Perry & Gerber 2006). The only specific locality that has been reported is The Settlement.

Ecology and conservation. No new information on this species has been reported since Carey (1972), who noted that "these skinks seemed to reach their greatest abundance in forested limestone areas amongst rock piles accumulated by the natives. They were occasionally seen basking on these piles" and "they were rarely found in trash piles." Several individuals examined contained nematodes and cysts in their body cavities. Maclean (1982) found one individual among loose piles of dry coral that comprised the foundation of a house in The Settlement on Anegada (no date of collection was reported). He kept it in captivity, where it ate insects and ground beef from his hand. Introduced domestic mammals are almost certainly a threat to the survival of *Spondylurus anegadae* **sp. nov.**, and on Anegada these include dogs, cats, goats, sheep, cattle, humans, and rats (Carey 1972). With the highest elevation being only 9 m above sea level, much of the land surface (and hence skink habitat) on the island is threatened by rising sea levels in coming decades as a result of global warming. The most recent sighting of *Spondylurus anegadae* **sp. nov.** was in the late 1990s (J. D. Lazell, personal communication).

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Spondylurus anegadae* **sp. nov.** to be Critically Endangered (CR A2ace). It faces a primary threat from predation by introduced mammals, including black rats, and a secondary threat from habitat alteration. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, if the species still exists.

Reproduction. Seven females with the following SVLs (mm) contained 1–2 (mean = 1.7) developing young: 54.5 (two young), 57.8 (two), 58.9 (one), 62.7 (two), 63.0 (one), 66.5 (two), and 68.2 (two). At least three other females (61.8–66.1 mm SVL) had recently given birth. The largest fetus was 28 mm SVL. Considering that the smallest juvenile measured was 30.9 mm SVL, the young of *Spondylurus anegadae* **sp. nov.** are approximately 28–30 mm SVL at birth. The date of collection for all of those specimens was 6 April 1936.

Etymology. The species name (*anegadae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Anegada.

Remarks. The earliest specimen collected was ZMUC-R 759, obtained by the Danish pharmacist Albert Heinrich Riise, with no specific locality ("West Indies"). We treat it as an associated specimen because, although it agrees mostly with *S. anegadae* **sp. nov.** in scalation and size, the dark dorsolateral stripes are narrower than typical members of that species. Although Riise's pharmacy was located on St. Thomas, he was known to travel widely in the Greater Puerto Rico Region in his collecting activities (Schmidt 1928).

Grant (1937) was the first to report this genus on Anegada, and most of the museum specimens were collected by him. He immediately noticed that they differed in color and size from skinks that he collected on other islands in the Puerto Rico region and sent them to Helen Gaige (UMMZ) for her opinion. She concurred but could not find other differences (Grant 1937). The size and pattern differences are striking (Fig. 2), but we also identified scale differences, as noted above. No tissues were available for molecular phylogenetic analysis, but details of the color pattern (e.g., short dark dorsolateral stripes) suggest a relationship with a species distributed nearby in the U.S. and British Virgin Islands, recognized here as *S. semitaeniatus* (see below).

Spondylurus anegadae **sp. nov.** is the only skink species known from Anegada, and we have not identified specimens of this species from any other islands, except associated specimen AMNH R99522, collected in 1966 by Beatty on Tortola (East-end Hills). The specimen is quite damaged from being shot, but it has the typical characters (of those that can be scored) of *S. anegadae* **sp. nov.** and not *S. semitaeniatus*, the only species known from Tortola. For example, it has 30 midbody scale rows (not found in *S. semitaeniatus*, common in *S. anegadae* **sp. nov.**), supraciliary-prefrontal contact (rare in *S. semitaeniatus*, common in *S. anegadae* **sp. nov.**), and pattern characteristics of *S. anegadae* **sp. nov.** (very short dorsal stripes, pale snout, virtually no dorsal spotting). Because specimens of *S. anegadae* **sp. nov.**, collected by Beatty from Anegada (AMNH R99523–24), immediately follow this specimen numerically, it is likely that there was a mix-up in specimen number and locality when the specimen was cataloged (or earlier). Thus, we consider AMNH R99522 to have an incorrectly labeled locality and that it likely came from Anegada.

Only slight ontogenetic change was observed in coloration. Fetuses look identical to adults except that the dark brown dorsolateral stripes extend to the tip of the snout, and pale lateral stripes (absent in adults) are visible (Fig. 56D). In the smallest juvenile (UMMZ 239525; 30.9 mm SVL), the snout tip stripe is present but reduced, whereas the adult pattern is present in a slightly larger juvenile (UMMZ 239522; 33.7 mm SVL).

Spondylurus caicosae **sp. nov.**
Caicos Islands Skink
(Figs. 54B, 55B, 59)

Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:546 (part).
Mabuya sloanii—Grant, 1937:520 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:20 (part).

Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. AMNH R-80126, an adult male, collected 10 February 1953 on Long Cay off South Caicos, Caicos Islands, Turks and Caicos, by G. B. Rabb.

Paratypes (n = 98). Caicos Islands, Turks and Caicos. AMNH R80125, AMNH R80127–30 (paratopotypes), same collection data as holotype; MCZ R-42061–62, J. C. Greenway, Ambergris Cay, March 1936; MCZ R-182881, G. Mitchell, Long Cay, 12 May 2000; MCZ R-183341, N. C. Mitchell, Long Cay, 28 October 2000; MPM 21932–37, 0.5 miles E Cockburn Harbor, South Caicos, 14 January 1961 (no collector available); UMMZ 117392–93, G. B. Rabb and C. L. Giovannoli, West Caicos, 4 February 1953; UMMZ 117394–96, G. B. Rabb and C. L. Giovannoli, West Cay of Six Hill Cays, 12 February 1953; USNM 81448, West Caicos, 4 August 1930 (no collector available). The following were all collected by A. Schwartz and colleagues: KU 242093–94, Bay Cay, 24 February 1972; KU 242095, Jacksonville, East Caicos, 22 January 1972; KU 242096, Little Ambergris Cay, 28 March 1972; KU 242097 (12 January 1961), KU 242116–29 (12–14 January 1961), KU 242130–66 (14 January 1961), KU 242167 (22 March 1961), vicinity of Cockburn Harbor, Long Cay; KU 242098, Bambarra, Middle Caicos, 25 January, 1972; KU 242099, Conch Bar, Middle Caicos, 31 January 1972; KU 242100–07, Kew, North Caicos, 6–21 February, 26 May 1972; KU 242108–09, vicinity of Belle Field Landing, North Caicos, 3 April 1974; KU 242110, Wades Green Plantation, North Caicos, 16 February 1972; KU 242111, near Whitby, North Caicos, 26 April 1974; KU 242112, Bottle Creek, North Caicos, 25 May 1971; KU 242113, Blue Hills, Providenciales, 22 February 1972; KU 242114, near Third Turtle Inn, Providenciales, 20 March 1972; KU 242115, Leeward, Providenciales, 16 March 1976; KU 242168–69, East Six Hill Cays, Caicos Islands, 18 January 1961.

Diagnosis. *Spondylurus caicosae* **sp. nov.** is characterized by (1) maximum SVL in males, 72.4 mm; (2) maximum SVL in females, 77.6 mm; (3) snout width, 2.14–3.66% SVL; (4) head length, 15.0–18.5% SVL; (5) head width, 10.9–14.8% SVL; (6) ear length, 1.06–2.10% SVL; (7) toe-IV length, 7.86–12.2% SVL; (8) prefrontals, two; (9) supraoculars, three (5%), four (95%); (10) supraciliaries, three (16%), four (84%); (11) frontoparietals, two; (12) supralabial below the eye, four (5%), five (86%), six (7%), seven (2%); (13) nuchal rows, one (9%), two (91%); (14) dorsals, 56–65; (15) ventrals, 56–72; (16) dorsals + ventrals, 113–134; (17) midbody scale rows, 27–32; (18) finger-IV lamellae, 9–14; (19) toe-IV lamellae, 13–19; (20) finger-IV + toe-IV lamellae, 22–32; (21) supranasal contact, Y (46%), N (54%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (38%), N (62%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y (weak); and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Spondylurus*, *S. caicosae* **sp. nov.** differs from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower dark dorsolateral stripe/middorsal stripe ratio (0.238–0.805 versus 0.874–3.79 in those other species). It is separated from *S. anegadae* **sp. nov.** and *S. macleani* by having distinct dorsal spots posterior to the dark dorsolateral stripes (versus essentially no dorsal pattern posterior to the dark dorsolateral stripes in those other species). It is separated from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having fewer midbody scale rows (27–32 versus 34 in those other species). From *S. fulgidus*, it is separated by having dark lateral stripes with paler (included) spots and irregular pale lateral stripes that extend only half-way (or less) to hindlimbs, ending in vertical bars (versus solid dark lateral stripes and pale lateral stripes continuous to the hindlimbs in *S. fulgidus*) and by having a lower number of supraciliaries (3–4 versus five in *S. fulgidus*). From *S. lineolatus*, it differs by having a longer head (head length 15.0–18.5% SVL versus 12.9–14.4% SVL in *S. lineolatus*) and by having two dark dorsolateral stripes and two dark lateral stripes (versus 10 dark stripes in *S. lineolatus*). It is distinguished from *S. monitae* **sp. nov.** by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales in *S. monitae* **sp. nov.**). It differs from *S. nitidus* in having a dark lateral stripe that extends only half-way (or less) to hindlimbs, ending in vertical bars (versus extending mostly to hindlimbs, albeit faintly, in *S. nitidus*). It differs from *S. turksae* **sp. nov.** in having a shorter ear (ear height 0.73–1.52% SVL versus 1.57–1.87% SVL), a narrower pale dorsolateral stripe (1.02–1.73% SVL versus 1.98–2.33% SVL), and a dark lateral stripe that extends only half-way (or less) to hindlimbs, ending in vertical bars (versus extending to hindlimbs in *S. turksae* **sp. nov.**).

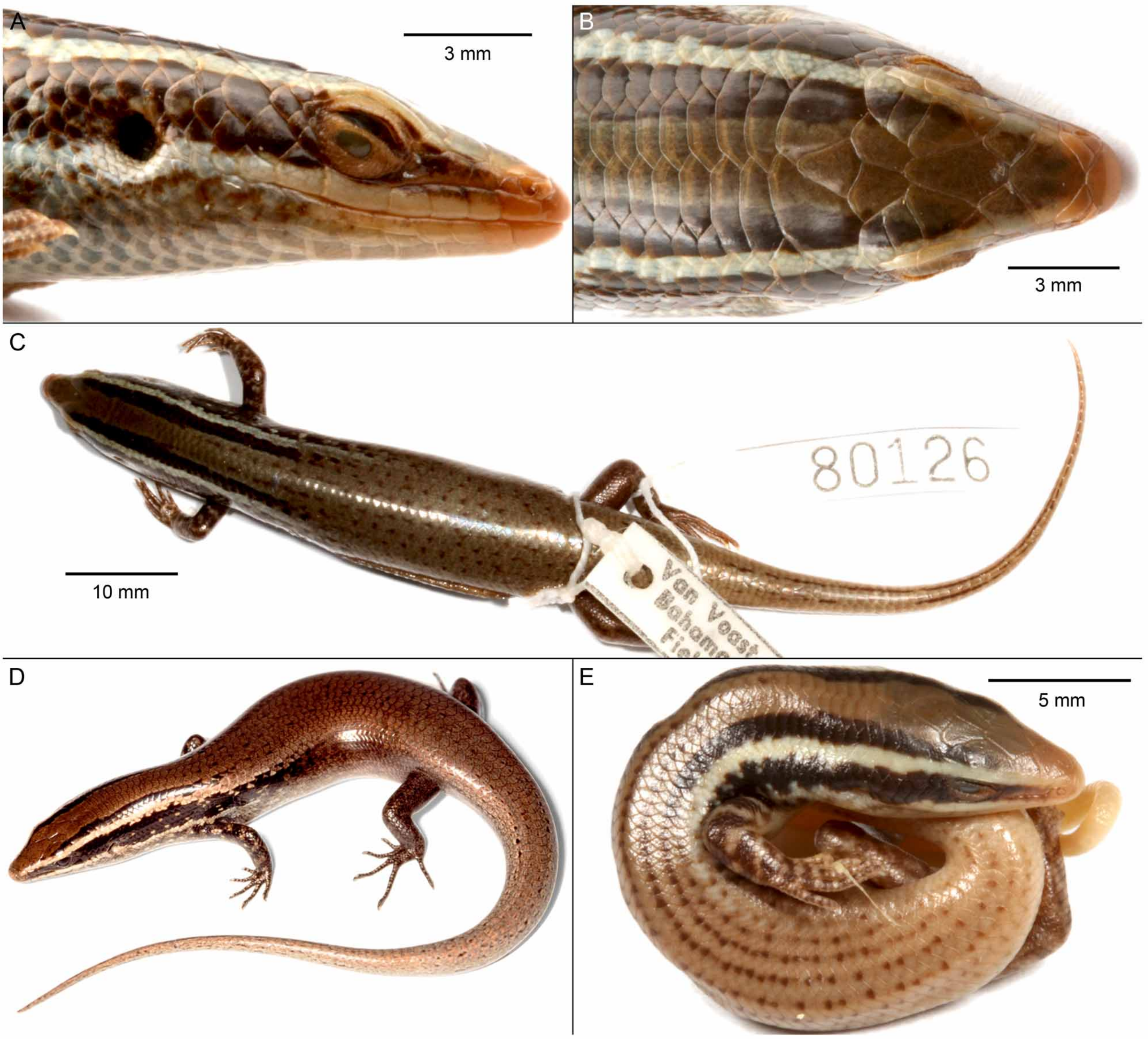

FIGURE 59. *Spondylurus caicosae* **sp. nov.**, from the Caicos Islands. (A–B) AMNH R-80126, holotype, Long Cay off South Caicos. (C) KU 242165, 0.8 km E Cockburn Harbor, South Caicos. (D) uncataloged, ca. 3 km W Kew, North Caicos (live individual photographed by S. B. Hedges, 16 August 1999). (E) fetus from KU 242153, 0.8 km E Cockburn Harbor, South Caicos.

Besides those non-overlapping differences, there are frequency differences that distinguish *Spondylurus caicosae* **sp. nov.** from other species. It differs from *S. nitidus* and *S. turksae* **sp. nov.** in being smaller (< 77.6 mm SVL in 99 specimens versus seven of 13 *S. nitidus* > 79.6 mm SVL and three of seven *S. turksae* **sp. nov.** > 77.7 mm SVL). From *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. magnacruzae* **sp. nov.**, *S. monae* **sp. nov.**, and *S. spilonotus*, it differs by having fewer supralabial scales (supralabial four or five below the eye in 91% of specimens versus supralabial six or seven below the eye in 83–100% of specimens belonging to those other species). It differs from *S. haitiae* **sp. nov.** by having fewer ventral scales (56–68 in 98% of specimens versus 69–72 in *S. haitiae* **sp. nov.**). From *S. macleani*, it is distinguished by having fewer midbody scale rows (27–31 in 94% of specimens versus 32–34 in *S. macleani*). It differs from *S. martinae* **sp. nov.** by having fewer ventral scales (56–65 in 95% of specimens versus 68–71 in *S. martinae* **sp. nov.**) and by having fewer finger-IV + toe-IV lamellae (22–29 in 92% of specimens versus 30–36 in 89% of specimens belonging to *S. martinae* **sp. nov.**). It differs from *S. nitidus* by having fewer finger-IV lamellae (9–12 in 89% of specimens versus 13–15 in 80% of specimens belonging to *S. nitidus*). It is distinguished from *S. powelli* **sp. nov.** by having fewer midbody scale rows (27–31 in 94% of specimens versus 32–34 in *S. powelli* **sp. nov.**) and by having fewer dorsals + ventrals (113–124 in 85% of specimens versus 125–132 in 93% of specimens belonging to *S. powelli* **sp. nov.**). From *S. semitaeniatus*, it differs by having a lower number of midbody scale rows (27–30 in 92% of specimens belonging to *S. caicosae* **sp. nov.** versus 31–34 in *S. semitaeniatus*). Additionally—and except for *S. anegadae* **sp. nov.**, *S. lineolatus*, and *S. powelli* **sp. nov.**—*S. caicosae* **sp. nov.** is a smaller species than all others within *Spondylurus* (maximum adult SVL 77.6 mm versus 79.3–107 mm in other species).

Description of holotype (Figs. 54B, 59A–B). An adult male in excellent state of preservation, without injuries and with an abdominal slit. SVL 55.3 mm; tail length not measured; HL 9.86 mm; HW 6.98 mm; SW 1.84 mm; EL 1.03 mm; and toe-IV length 6.69 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal octagonal, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal heptagonal and elongate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial and posteroventral projections on latter. One upper preocular and two lower preoculars (one medial). Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye (four on the left) comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 58 in a longitudinal row; ventrals similar to dorsals; 61 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 11 under finger-IV and 16 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brownish-gray with small and often triangular-shaped (pointed anteriorly) dark brown spots, distributed in thin lines on body and tail (Fig. 55B). Dark dorsolateral stripes present, narrow (1.38 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown with whitish spots, extending from loreal region to first third of body and ending in 2–3 dark brown vertical bars or spots (Fig. 55B). Pale middorsal stripe present, wide (2.70 mm), brownish-gray, extending from tip of snout to first third of body. Pale dorsolateral stripes present, whitish, extending from tip of snout to first third of body. Pale lateral stripes whitish, extending from tip of snout to forelimbs. Forelimbs pale gray with large brown spots and mottling on dorsal surfaces and without pattern on ventral surfaces; hindlimbs slightly darker than ground color and with more subdued brown spotting on dorsal surfaces (than on forelimbs) and without pattern on ventral surfaces. Ventral surface of body without pattern. Palmar and plantar surfaces dark brown. No information on color in life of holotype is available.

Variation. In coloration and scalation, most specimens resembled the holotype (Tables 4–5), despite being from a large number of different islands in the Caicos archipelago.

Distribution. The species is widely distributed throughout the Caicos Islands, Turks and Caicos (Fig. 9C).

Ecology and conservation. One of us (S.B.H.) encountered 3 individuals at Wades Green Plantation on North Caicos in August, 1999. One was under a rock, and the other two were fighting each other on a vertical rock wall. Habitat notes associated with the large KU series include the following observations: 0.3 m above ground on bluff, under rock, sunning on stone walls, 5.2 m in a tree, and crawling on rocks. These notes indicate that *Spondylurus caicosae* **sp. nov.** is a good climber. The absence of the mongoose probably explains why this species has survived on the islands. However, current threats include rats and domestic mammals, agriculture, and increased development for tourism, which is reducing habitat quality and area (Reynolds 2011).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus caicosae* **sp. nov.** to be Vulnerable (VU A2ace). It faces a primary threat from predation by introduced mammals, including black rats, and a secondary threat from habitat alteration. Studies are needed to determine the health of the populations, and threats to the survival of the species.

Reproduction. Twenty-two females (61.8–76.4 mm SVL) contained 1–3 (mean = 2.2) developing young. All of those specimens were collected January–March.

Etymology. The species name (*caicosae*) is a feminine genitive singular noun referring to the distribution of the species in the Caicos Islands.

Remarks. The uniqueness of the skinks from the Caicos Islands has been hinted in earlier work. For example, Mayer and Lazell (2000) noted some pattern differences between skinks from those islands compared with those of the Puerto Rico region. Biogeographic connections between the Turks and Caicos fauna and that of the Puerto Rico region have been noted as well (Thomas & Hedges 2007) and are consistent with the direction of water currents which would have carried animals on flotsam (Hedges 1996b). *Spondylurus caicosae* **sp. nov.** has a smaller body size and wider dorsolateral stripes than *S. turksae* **sp. nov.**, and the dark lateral stripes usually extend only one-third of the way to the hindlimbs. In these ways, *S. turksae* **sp. nov.** resembles *S. nitidus* more than *S. caicosae* **sp. nov.** Nonetheless, both species are small (maximum SVL, 78–79 mm) compared to others in the genus, including *S. nitidus* (96 mm SVL), have proportionately short heads (average head lengths 15.9–16.3% SVL, versus 18.3% SVL in *S. nitidus*), and low numbers of midbody scale rows (rarely > 30), suggesting a close relationship. Note added in proof: our DNA sequence analyses indicate a separate origin for *S. turksae* from the Puerto Rican Bank.

Spondylurus culebrae sp. nov.
Culebra Skink
(Figs. 54C, 55C, 60)

Mabuya sloanii—Stejneger, 1904:608 (part).
Mabuya sloanii—Barbour, 1914:320 (part).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya semitaeniatus—Grant, 1931:217 (part).
Mabuya semitaeniatus—Grant, 1932a:162 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya sloanii—Grant, 1937:504 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:29 (part).
Mabuya mabouya sloani—Rivero, 1978:71 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya mabouya sloani—Rivero, 1998:394 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. UMMZ 73823, an adult male, collected April 1932 on Culebra, Puerto Rico, United States (no specific locality within Culebra) by Chapman Grant.

Paratypes (n = 49). Culebra, Puerto Rico. AMNH R-14005–06, K. P. Schmidt & B. A. Wall, no specific locality, 5 October 1919; UMMZ 73819–20, UMMZ 73822–23, UMMZ 73826, UMMZ 239548–80 and 239582–89, C. Grant, no specific locality, February–April, 1932. USNM 576302, no specific locality, R. Thomas. Culebrita, Puerto Rico. UMMZ 80786, C. Grant, no specific locality, August, 1936.

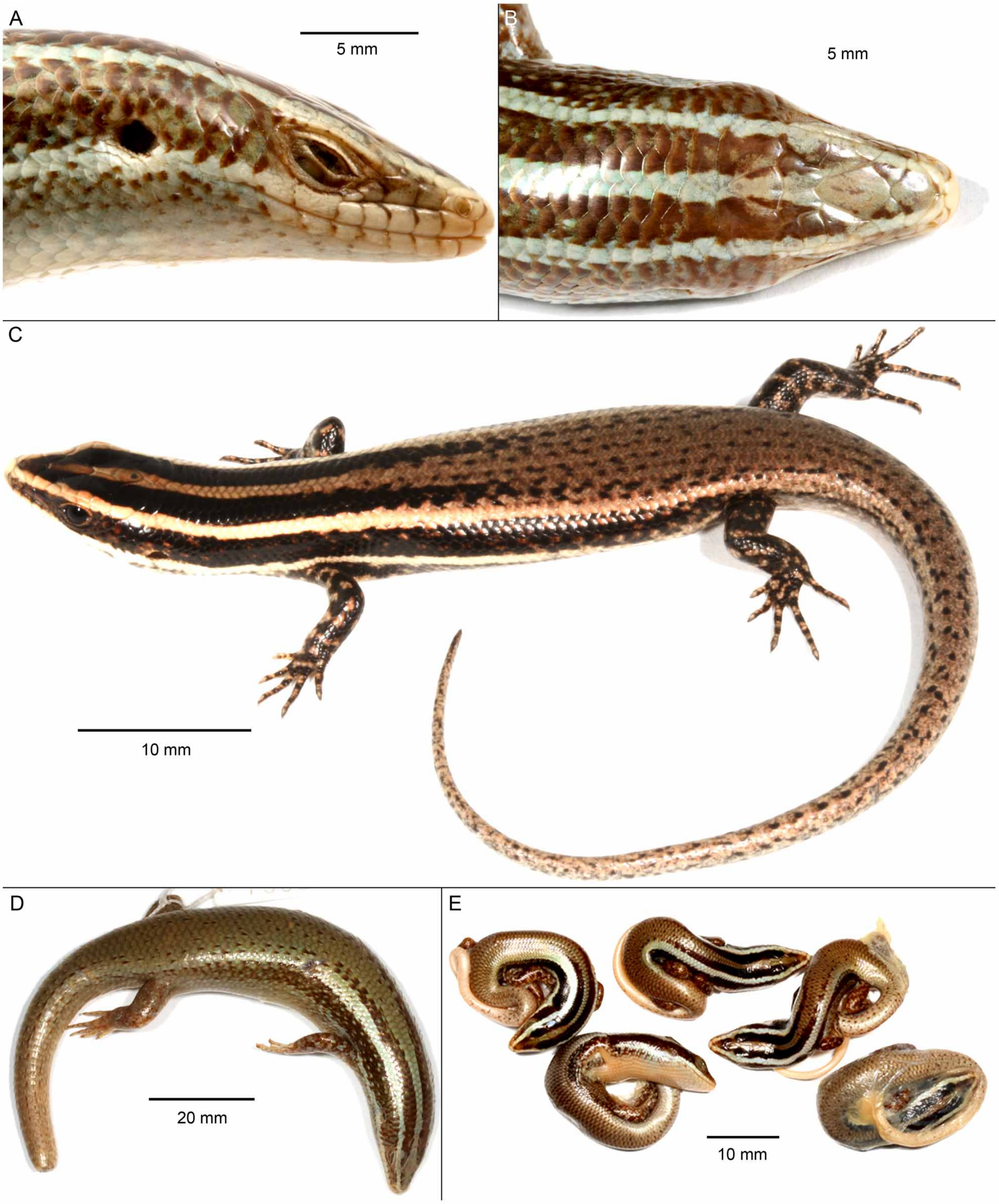

FIGURE 60. *Spondylurus culebrae* **sp. nov.**, from Culebra Island, Puerto Rico. (A–B, D) UMMZ 73823, holotype. (C) uncataloged (live individual). (E) fetuses of UMMZ 239553. All from "Culebra Island" (no specific locality within island).

Diagnosis. *Spondylurus culebrae* **sp. nov.** is characterized by (1) maximum SVL in males, 88.0 mm; (2) maximum SVL in females, 97.6 mm; (3) snout width, 2.28–3.50% SVL; (4) head length, 16.0–21.6% SVL; (5) head width, 11.4–16.1% SVL; (6) ear length, 1.36–2.36% SVL; (7) toe-IV length, 8.42–12.9% SVL; (8) prefrontals, two; (9) supraoculars, three (14%), four (86%); (10) supraciliaries, three (2%), four (90%), five (6%), six (2%); (11) frontoparietals, two (98%), three (2%); (12) supralabial below the eye, five (16%), six (82%), seven

(2%); (13) nuchal rows, one (4%), two (88%), three (8%); (14) dorsals, 57–65; (15) ventrals, 60–70; (16) dorsals + ventrals, 121–134; (17) midbody scale rows, 30–36; (18) finger-IV lamellae, 13–16; (19) toe-IV lamellae, 14–19; (20) finger-IV + toe-IV lamellae, 28–34; (21) supranasal contact, Y (80%), N (20%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (29%), N (71%); (24) parietal contact, Y (98%), N (2%); (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. culebrae* **sp. nov.** differs from *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (0.953–2.24 versus 0.115–0.916 in those other species). It differs from *S. anegadae* **sp. nov.**, *S. macleani*, and *S. turksae* **sp. nov.** by having dark dorsal spots posterior to the dark dorsolateral stripes (versus essentially no dorsal pattern posterior to the dark dorsolateral stripes in those other species). It differs from *S. haitiae* **sp. nov.** and *S. lineolatus* by having a longer head (head length 16.0–21.6% SVL versus 12.9–15.8% SVL in those other species). From *S. anegadae* **sp. nov.**, it is separated by a plot of interparietal width versus SVL (Fig. 57). It is distinguished from *S. fulgidus* by having a higher number of combined dorsals and ventrals (121–134 versus 108–120 in *S. fulgidus*). It is separated from *S. lineolatus* by having a higher number of midbody scale rows (30–36 versus 26–28). It differs from *S. monae* **sp. nov.** by having a higher, shorter rostral scale (Fig. 61). From *S. monitae* **sp. nov.**, it differs by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales). From *S. semitaeniatus*, it is distinguished by having longer total head scalation (Fig. 62A). From *S. sloanii*, it is distinguished by having a relatively longer head and more finger-IV lamellae (Fig. 62B).

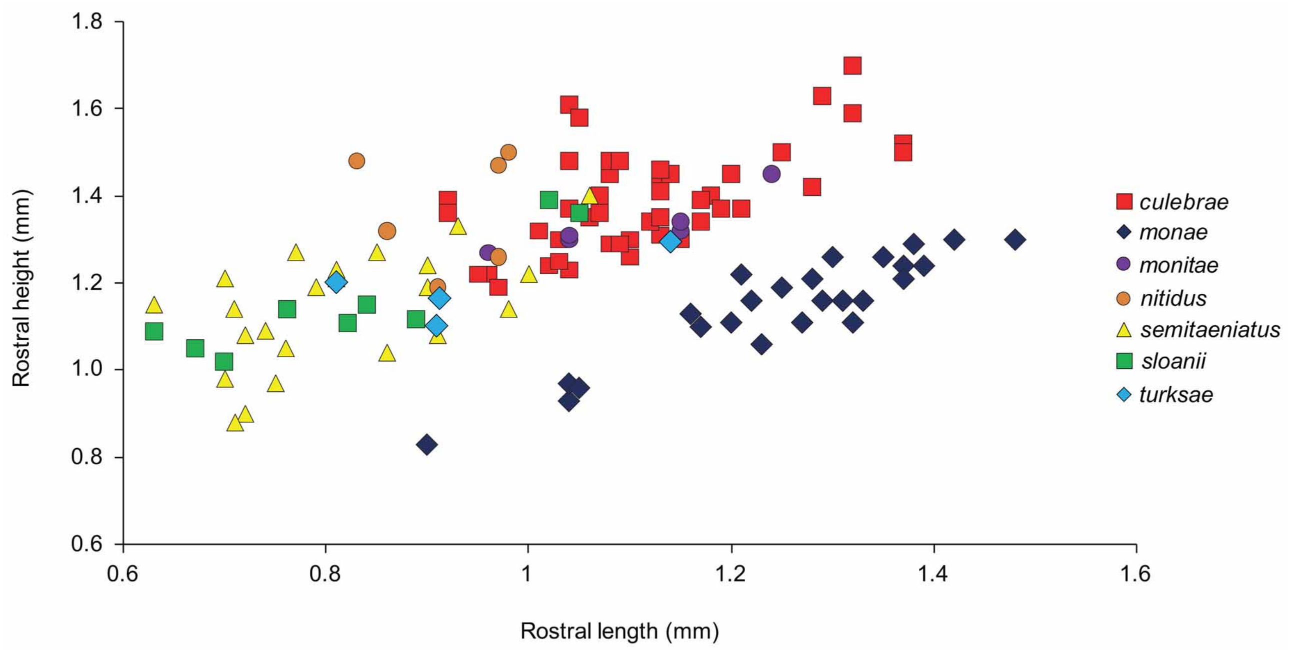

FIGURE 61. Graph of rostral height versus rostral length in seven species of the Genus *Spondylurus*.

The following frequency differences also distinguish *Spondylurus culebrae* **sp. nov.** from other species. It differs by having supranasal contact in 80% of specimens versus no contact in 81–100% of specimens belonging to *S. martinae* **sp. nov.**, *S. powelli* **sp. nov.**, and *S. turksae* **sp. nov.** It is distinguished from *S. monitae* **sp. nov.** by having a higher number of supralabial scales (supralabial six or seven below the eye in 84% of specimens versus supralabial five below the eye in *S. monitae* **sp. nov.**). *Spondylurus culebrae* **sp. nov.** tends to have more midbody scale rows (30–36) than *S. nitidus* (28–33); 78% of *S. culebrae* **sp. nov.** have 32 or more whereas 53% of *S. nitidus* have 30 or fewer. *Spondylurus culebrae* **sp. nov.** also tends to have more dorsals + ventrals (121–134) than *S. nitidus* (117–129); 88% of *S. culebrae* **sp. nov.** have 123 or more whereas 46% of *S. nitidus* have 122 or fewer. From *S. sloanii*, it differs by having more finger-IV + toe-IV lamellae (30–34 in 81% of *S. culebrae* **sp. nov.** versus

24–29 in 95% of *S. sloanii*) and by having a greater separation of the prefrontals (frontal/frontonasal suture length 0.51–1.2% SVL in 84% of *S. culebrae* **sp. nov.** versus 0–0.38% SVL in 81% of *S. sloanii*). Additionally, *S. culebrae* **sp. nov.** is a large species (maximum adult SVL 97.6 mm versus 63.7–95.5 mm in all others within *Spondylurus* except *S. magnacruzae* **sp. nov.** and *S. spilonotus*).

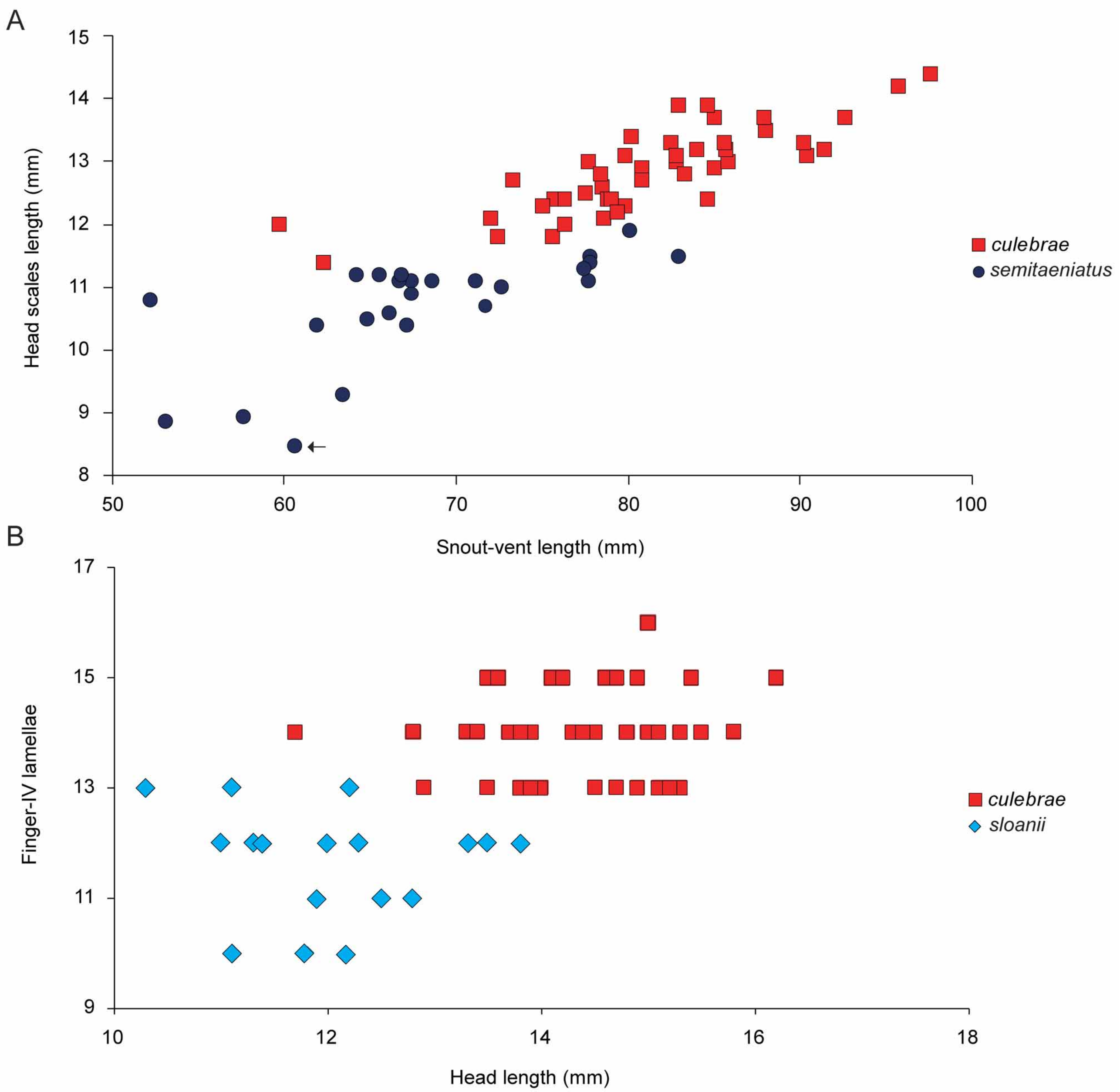

FIGURE 62. Graphs of scalation differences between *Spondylurus culebrae* **sp. nov.** and other species. (A) graph of head scales length (posterior edge of rostral to posterior edge of parietals) versus snout-vent length in *S. culebrae* **sp. nov.** and *S. semitaeniatus*. The lectotype of *S. semitaeniatus* is indicated with an arrow. (B) graph of finger-IV lamellae versus head length in *S. culebrae* **sp. nov.** and *S. sloanii*.

Description of holotype (Figs. 54C, 60A–B, D). An adult male in excellent state of preservation, without injuries and with an abdominal slit. SVL 85.6 mm; tail length 50.2 mm (broken); HL 14.8 mm; HW 11.0 mm; SW 2.60 mm; EL 1.67 mm; and toe-IV length 8.30 mm; ear-opening average in size and round; toe length in the following order: I < II = V < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal arrowhead-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal octagonal, semi-lanceolate, elongate, in contact with the first and second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars (supraoculars three and four fused on the right), the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posterodorsal projection on latter. One upper preocular and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, the first paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 59 in a longitudinal row; ventrals similar to dorsals; 63 in a longitudinal row; 33 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 18 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color pale green with small-to-medium dark brown spots, uniformly distributed on body and tail. Dark dorsolateral stripes present, wide (2.85 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown, extending from loreal region to last third of body. Pale middorsal stripe present, narrow (1.69 mm), pale green, extending from tip of snout to first third of body. Pale dorsolateral stripes present, whitish, extending from tip of snout to first third of body. Pale lateral stripes present, whitish, extending from below eye to midbody, bordered below by some dark spotting but not a narrow dark line. Ventral surface of body without pattern. Forelimbs and hindlimbs with distinct barring or mottling, darker on forelimbs. Palmar and plantar surfaces unpigmented. No information on color in life is available on the holotype.

Variation. In coloration and scalation, most specimens resembled the holotype (Tables 4–5), except that dorsal ground color varied among shades of brown, gray, bluish-green, and green in adults and gray or tan in juveniles. In some specimens, only a few dark dorsal spots were present; in others, many dark dorsal spots were arranged in broken stripes extending the length of the body. The pale dorsolateral stripes differed in coloration between specimens but often appeared white or some shade of pale blue. In some specimens, the color of the pale middorsal stripe matched that of the pale dorsolateral stripes, but in others, the pale middorsal stripe was darker. Grant (1931) agreed, stating, “The median line on the head is as light as the white dorso-lateral line in some from Mona and Culebra islands,” but he noted cream-colored pale dorsolateral stripes in those specimens. Therefore, the bluish-green coloration we observed probably resulted from preservative. Grant (1931) mentioned similar coloration between adults and juveniles but said that juvenile tails, in life, were lavender with white tips, something that we did not observe in a live juvenile *S. culebrae* **sp. nov.** (Fig. 60C).

Distribution. The species is distributed on Culebra and the adjacent islet of Culebrita (Fig. 10D). We tentatively assign the skinks from the islets of Cayo Luis Peña and Cayo Norte to *S. nitidus*, a species which is also sympatric with *S. culebrae* **sp. nov.** on Culebra.

Ecology and conservation. Grant (1931) found specimens among the cactus *Opuntia* "at sea level just above the beaches and among the rocks on the hills.” He also stated that they can be found inside houses. Culebra has a human population of ~2,000, and the major threats to the skink are introduced mammals, especially the rats. These introduced predators do not recognize the boundaries of the wildlife refuge on Culebra, and therefore the skinks are not actually protected. All of the original, virgin forest on Culebra has been destroyed, including that in the protected area, and land development and agriculture continue to decrease available habitat for reptiles even though secondary forests are present (Kessler 2010).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus culebrae* **sp. nov.** as Critically Endangered (CR A2ace). It faces a primary threat from predation by introduced mammals, including black rats, and a secondary threat from habitat alteration. Studies are needed to determine the health of remaining populations, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. Eleven females (78.6–97.6 mm SVL) contained 2–5 (mean = 3.55) developing young. The dates of collection for those specimens were 1 February 1932, March 1932, April 1932, and August 1936.

Etymology. The species name (*culebrae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Culebra.

Remarks. Wiegmann (1837) described *Euprepes semitaeniatus* (= *Spondylurus semitaeniatus*), but its locality was unknown. Although color differences between *S. semitaeniatus* and *S. sloanii* were noted by Stejneger (1904) and Schmidt (1928), *S. semitaeniatus* was later lumped with *S. sloanii* because of a lack of other distinct morphological differences. Grant (1931) resurrected the name *S. semitaeniatus* for the skinks on Mona and Culebra based on the color and pattern of his specimens, noting a number of differences between them and skinks from other islands. However, a few years later (Grant 1937) he treated them again as *S. sloanii*, without comment. As will be shown below, *S. sloanii* and *S. semitaeniatus* are both valid species, distinct from *S. culebrae* **sp. nov.** and restricted to the Virgin Islands. Although the range of *S. sloanii* is only ~10 km from that of *S. culebrae* **sp. nov.** whereas *S. monitae* **sp. nov.** is ~300 km from both (and separated by the entire island of Puerto Rico, where *S. nitidus* occurs), the three species show similar levels of sequence divergence (Fig. 5–6), lending additional support to their recognition as distinct species.

One specimen of the long series of skinks (n = 51) from Culebra, UMMZ 239581, collected by Grant in April 1932, appears to belong to *S. nitidus* based on scalation and the non-overlapping pattern character noted above. It has a dark dorsolateral stripe width/middorsal stripe width ratio of 0.742 versus 0.953–2.24 in *S. culebrae* **sp. nov.** and 0.292–0.619 in *S. nitidus*. It has 118 dorsals + ventrals, consistent with *S. nitidus* (117–129) but non-overlapping with *S. culebrae* **sp. nov.** (121–134). It also has 30 midbody scale rows, typical of *S. nitidus* but at the low extreme of *S. culebrae* **sp. nov.** (84% of *S. culebrae* **sp. nov.** with > 30 midbody scale rows). Specimens from Cayo Luis Peña (UMMZ 73827) and Cayo Norte (UPRRP 5055), small islets off of Culebra, similarly agree with *S. nitidus* and not *S. culebrae* **sp. nov.** It seems remarkable that these two species occur on and around the small island of Culebra, given the taxonomic history of Caribbean island skinks. But when one considers the reduction in abundance, and likely extinctions, caused by the mongoose, the coexistence of multiple species—as also documented in the Virgin Islands and Windward Islands—should not be surprising. Genetic data from *S. nitidus*, including those from Puerto Rico and Culebra, would help confirm this apparent case of sympatry in two very closely related species.

***Spondylurus fulgidus* (Cope 1862) comb. nov.**

Jamaican Skink
(Figs. 54D, 55D, 63)

Lacerta mabouya—Shaw, 1802:287 (part).
Scincus sloanii—Daudin, 1803:287 (part).
Scincus sloanei—Fitzinger, 1826:23 (part).
Tiliqua sloanii—Gray, 1831:70 (part).
Tiliqua sloanii—Gray, 1838:293 (part).
Eumeces sloanii—Duméril & Bibron, 1839:639 (part).
Mabouya sloanei—Gray, 1845:94.
Mabouya agilis—Gosse, 1849:307 (part).
Mabouya agilis—Gosse, 1851:75 (part).
Mabuia fulgida—Cope, 1862:185 (new lectotype designation: USNM 5759 collected on Jamaica, no specific locality, by Charles Baker Adams in 1844–49).
Euprepes spilonotus—Peters, 1864:50 (part).
Eupr[epes] spilonotus—Peters, 1871:400.
Euprepes (Mabuia) spilonotus—Peters, 1876:708 (part).
Mabuya fulgida—Bocourt, 1879:403.
Mabuia sloanii—Boulenger, 1887:193 (part).
Mabuia sloanii—Garman, 1887.

M[abuya] spilonotus—Stejneger, 1904:609.
Mabuia sloanii—Barbour, 1910:299 (part).
Mabuya spilonota—Barbour, 1914:320.
Mabuya spilonota—Barbour, 1930:105.
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya spilonotus—Grant, 1940:111.
Mabuya spilonotus—Murray, 1949:128.
Mabuya spilonota—Cochran, 1961:126.
Mabuya spilonota—Horton, 1973:85.
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:6 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Material examined (n = 35). Jamaica. USNM 5759 (lectotype), an adult female, Charles B. Adams, no specific locality (date of collection inferred to be either 1844–45 or 1848–49; see Remarks); UMMZ 53306–09, UMMZ 92371A–D, USNM 572081–85 (paralectotypes), same locality data as lectotype; ANSP 13597–99, "Dr. Slocum," donated by Cope (no additional collection information available); BMNH RR 1966.315–316, "Mr. Fraser," Bluefields (before 1887) (Boulenger 1887); BMNH 52.1.21.6–7, P. H. Gosse, no specific locality (1844–46); MCZ R-6053, S. Garman, Kingston (1880; date indicated by Grant, 1940); MCZ R-7344A–C, T. Barbour, Beacon Hill, Bath, St. Thomas Parish, 1909; ZMH R09298, “Riise,” "St. Thomas" (in error), accessioned 1877. The following were collected by Chapman Grant at Portland Point: MCZ R-45195–96 (18 April 1937), MCZ R-45197 (31 January 1938), UMMZ 85862 (January 1938), UMMZ 85861 (22 April 1937), UMMZ 239601–04 (22 April 1937).

Material not examined (n = 7). Jamaica. MNHN 2904 (paralectotype; Brygoo 1985), exchanged from ANSP in ca. 1862, presumably same collecting data as lectotype; SMNS 1261, A. C. Günther, no specific locality or date; USNM 108311–313, Portland Point (1922–1938; no collector information available); USNM 117674, Portland Ridge (19 August 1941; no collector information available); YPM HERR.000857, A. Petrunkevitch, Malvern, St. Elisabeth Parish (no collection date available).

Diagnosis. *Spondylurus fulgidus* is characterized by (1) maximum SVL in males, 77.0 mm; (2) maximum SVL in females, 84.8 mm; (3) snout width, 2.21–3.73% SVL; (4) head length, 16.3–20.9% SVL; (5) head width, 11.0–14.1% SVL; (6) ear length, 1.46–2.83% SVL; (7) toe-IV length, 9.07–12.9% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, five; (11) frontoparietals, two; (12) supralabial below the eye, five (25%), six (67%), seven (8%); (13) nuchal rows, two (68%), three (32%); (14) dorsals, 52–58; (15) ventrals, 55–65; (16) dorsals + ventrals, 108–120; (17) midbody scale rows, 28–32; (18) finger-IV lamellae, 12–16; (19) toe-IV lamellae, 14–19; (20) finger-IV + toe-IV lamellae, 27–35; (21) supranasal contact, N; (22) prefrontal contact, Y (52%), N (48%); (23) supraocular-1/frontal contact, Y (48%), N (52%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Within the Genus *Spondylurus*, *S. fulgidus* is separated from *S. caicosae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. powelli* **sp. nov.**, *S. semitaeniatus*, *S. sloanii*, and *S. spilonotus* by having a higher number of supraciliaries (five versus 3–4 in those other species). It differs from *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. macleani*, *S. martinae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. powelli* **sp. nov.**, and *S. spilonotus* by having a lower number of combined dorsals and ventrals (108–120 versus 121–134 in those other species). From *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii*, it is distinguished by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.115–0.759 versus 0.874–3.79 in those other species). It is separated from *S. haitiae* **sp. nov.** and *S. lineolatus* by having a longer head (16.3–20.9% SVL versus 12.9–15.8% SVL in those other species). It differs from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having a lower number of midbody scale rows (28–32 versus 34 in those other species). It differs from *S. caicosae* **sp. nov.** and *S. macleani* by having solid dark lateral stripes and pale lateral stripes continuous to the hindlimbs (versus dark lateral stripes with paler spots and irregular pale lateral stripes that are discontinuous or absent at the hindlimbs in *S. caicosae* **sp. nov.** and no lateral stripes in *S. macleani*; Fig. 55B, D, G). It differs from *S. turksae* **sp. nov.** in having fewer dorsals (52–58 versus 59–63) and longer toes (toe-IV length 9.07–12.9% SVL versus 7.05–8.90% SVL). It is separated from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, and *S. nitidus* by having a higher number of supraciliaries (five versus 3–4 in 93–95% of specimens belonging to those other species).

Description of lectotype (Fig. 63A–C). An adult female in good state of preservation, with injury to anterior dorsum and with an abdominal slit. SVL 58.4 mm; tail broken near tip, not measured; HL 12.2 mm; HW 7.85 mm; SW 1.87 mm; EL 1.63 mm; and toe-IV length 7.04 mm; ear-opening large in size and oval; toe length in the following order: I < II = V < III < IV.

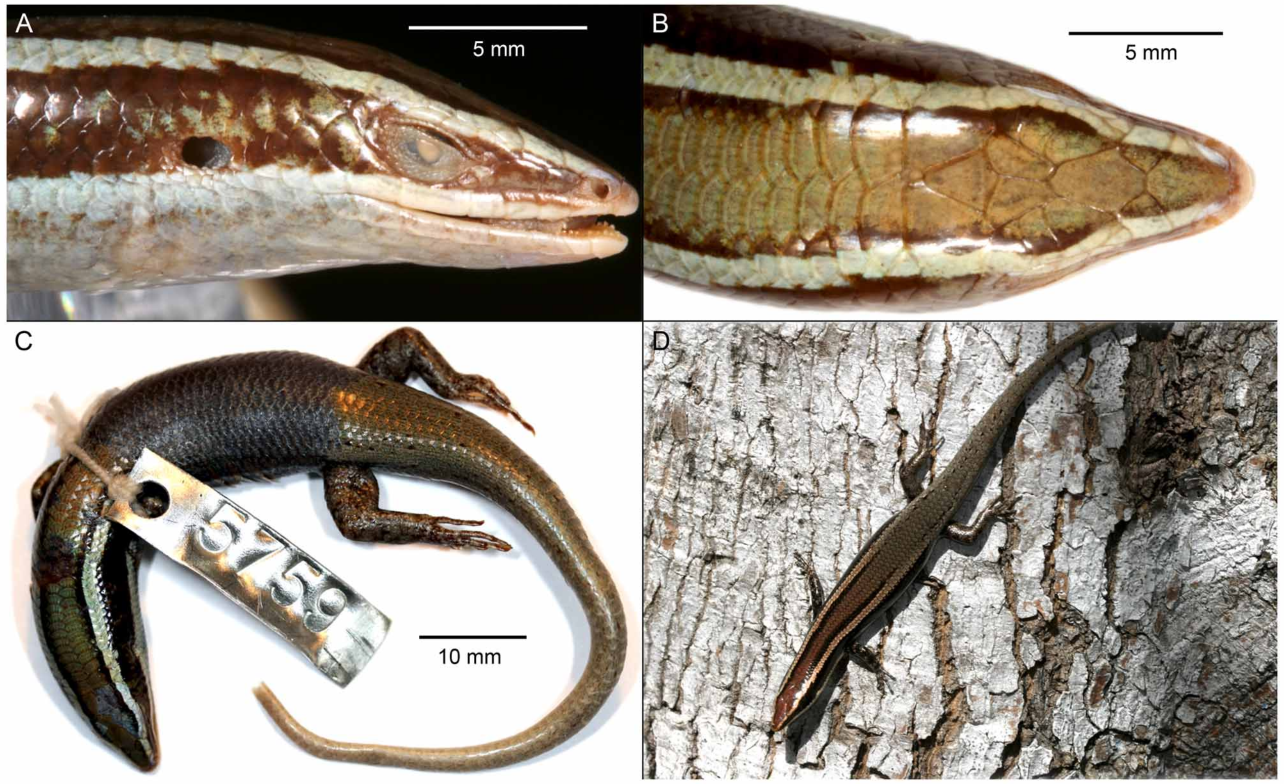

FIGURE 63. *Spondylurus fulgidus*, from Jamaica. (A–C) USNM 5759, lectotype, "Jamaica" (no specific locality). (D) uncataloged, Hellshire Hills (live individual, photographed by J. Burgess, January, 2009).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first and second supraoculars, and frontal. Frontal hexagonal, oblong, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal (near-triangular), semi-lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales (near contact with primary temporal). Four supraoculars, the second one being the largest. Five supraciliaries, approximately equal in length. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular. Two upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 54 in a longitudinal row; ventrals similar to dorsals; 60 in a longitudinal row; 28 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 14 under toe-IV. Fingers and toes clawed.

Pattern and coloration. Dorsal ground color medium brownish-green with only a few small dark brown spots, distributed on body. Dark dorsolateral stripes present, narrow (0.75 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown, extending from behind eye to last third of body where they fade towards the hindlimb. Pale middorsal stripe present, wide (4.06 mm), brownish-green, extending from top of head to first third of body. Pale dorsolateral stripes present, whitish, extending from tip of snout to first third of body. Pale lateral stripes present, whitish, extending from below ear to midbody where they fade toward the hindlimb, bordered below by darker pigment. Forelimbs and hindlimbs with distinct barring, darker on forelimbs. Ventral surface of body without pattern. Palmar and plantar surfaces medium or dark brown. No information is available on color in life of the holotype.

Variation. In coloration and scalation, most specimens resembled the holotype (Tables 4–5). The most distinctive pattern features that we noticed were the pale and dark lines outlining the top of the snout, the wide middorsal pale (tannish) stripe, and the almost zebra-like limb barring. Gosse (1849) described the color in life: "Head, neck and fore-part of back reddish brown, bronzed; a broad band of black runs from the muzzle on each side, enclosing the eye, and passing down to the hind-leg; this band is bounded, both above and below, by a band of yellowish white, gradually becoming obsolete between the fore- and hind-leg; each of these pale bands is again bounded by a line of black, more or less interrupted or maculate, the superior of which extends along the tail; lower back and tail, greenish brown; whole under-parts greenish white, silvery; upper surface of the limbs and feet black, with pale confluent spots. The whole animal reflects a metallic glass. There is no appreciable difference in the sexes." Gosse also made a color illustration of the Jamaican skink, published 100 years later by Murray (1949). Grant (1940) described color in life, also noting the brown (bronze) to greenish (gray-green) transition, from anterior to posterior. He noted the venter was gray and the legs and toes were "finely checkered" in black, brown, and bluish-gray, with palms and soles dark brown.

Distribution. This species is distributed on Jamaica, where all records have come from near the southern coast of the island (Fig. 9A).

Ecology and conservation. Sloane (1725) noted and figured the species, but he also confused it with other species in his observations. The English naturalist Philip Henry Gosse (1810–1888) collected skinks in Jamaica during 1844–46 and wrote about their habits (Gosse 1849; 1851). His specimens are in the BMNH. Gosse's observations were made prior to the introduction of the mongoose, which occurred in 1872. In stark contrast to their rarity now, Gosse (1849) found the skinks to be abundant and "most numerous in the lowlands, and on the gently-sloping hills of moderate elevation that form the characteristic feature of the southern side of that beautiful island. The fences there are largely composed of 'dry-wall,' built of rough unhewn stones, without cement. On these walls the *Mabouya* may be seen crawling, and often lying quite still in the sunshine; when alarmed it darts with lightning-like rapidity into one of the crevices which abound in all parts of such a structure. Indeed it rarely ventures far from some refuge of this kind, and I presume that the facilities for instant retreat afforded by these pervious walls are the chief cause of its preference for them. It is scarcely ever seen on the ground, except when avoiding danger; nor on the trunk or branches of trees or shrubs; but in the concavity of a pinguin leaf (*Bromelia pinguin* Linnaeus) it is occasionally observed to lie, basking in the sun" (Gosse 1849).

Sixty years later, Barbour's (1910) experiences were much different. "This little skink..is now one of the rarer members of the island fauna. Along with the other ground-inhabiting creatures of the lowlands near the coast this has been preyed upon extensively by the mongoose. About Kingston we procured three examples, and these were the only ones seen during our stay on the island." Later (Barbour 1930a), he remarked that "it has lately been shown to feed on sphaerodactyls."

Grant (1940), in discussing mabuyine skinks in Jamaica, noted "this genus and *Alsophis*, throughout the Antilles where the writer has collected, has suffered from the mongoose more than any other reptile. It was gratifying to find *Mabuya* abundant on Portland Point where the very porous, hard limestone offers effective sanctuary anywhere and everywhere. This lizard is slow, durious, and trustful and needs all the protection it can get."

The only observations of *Spondylurus fulgidus* in recent years have been in a restricted portion of the Hellshire Hills, where it is uncommon and considered the "last stronghold" of the species, and rarely in one or two other locations along the south coast (Wilson 2011). In contrast to Gosse's claim that it does not climb trees, it has been observed climbing tree trunks (Fig. 63D). Whether that represents selection for individuals that can escape the mongoose or just a behavior not observed by Gosse is unknown. One of us (S.B.H.) has spent, cumulatively, approximately four months surveying reptiles and amphibians throughout Jamaica, including many potential dry forest habitats on the south coast, but has never encountered the species. Likewise, no museum specimens could be identified with collection dates later than 1941, despite intensive survey work by herpetologists during the latter half of the 20th century. A study of the mongoose in the Hellshire Hills revealed that the skink comprised 10% of its diet (Lewis *et al.* 2011), which is an alarming amount of predation pressure on a species already close to extinction. Cats, rats, and mice have been mentioned as additional potential predators, besides the mongoose (B. Wilson, personal communication; Grant 1940). Natural forests in Jamaica have been severely depleted (World Resources Institute 2008) because of agriculture, bauxite mining, tourism, and urbanization, and threats to natural habitats continue even in protected areas.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus fulgidus* as Critically Endangered (CR A2ace). It faces a primary threat from the introduced mongoose, which has led to its near-extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine the health and extent of remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, because eradication of introduced mammalian predators is not possible on Jamaica. It has been suggested that the species could be introduced to the Goat Islands of Jamaica, to afford survival away from the mongoose (Wilson 2011).

Reproduction. Gosse (1849) discussed reproduction in this species on Jamaica, noting that he found several (three?) fetuses in a female killed on February 11th and five in another killed on 29th of April. One small adult female (UMMZ 85861, 67 mm SVL) collected at Portland Point, 22 April 1937, has three developing young, as was noted by Grant (1940).

Etymology. The etymology was not provided in the original description. However, the species name (*fulgidus*) is a Latin feminine singular adjective meaning shining or brilliant, likely referring to the dorsal coloration of this species, described as "metallic" and "cupreous" (Cope 1862).

Remarks. Charles Baker Adams (1814–1853), malacologist and collector of the type series, spent winters of 1844–45 and 1848–49 in Jamaica (Fletcher & Young 1927), thus constraining the collection date of the lectotype and paralectotypes. Coincidentally, Adams' field work in Jamaica overlapped with that of the Gosse (1844–46).

***Spondylurus haitiae* sp. nov.**
Hispaniolan Four-lined Skink
(Figs. 55E, 64A, 65)

Mabuia nitida—Garman, 1887:51 (originally a syntype).
Mabuya sloanii—Stejneger, 1904:608 (part).
Mabuya sloanii—Barbour, 1914:320 (part).
Mabuya sloanii—Schmidt, 1928:121 (part; removed from type series of *Mabuia nitida*).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:24 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

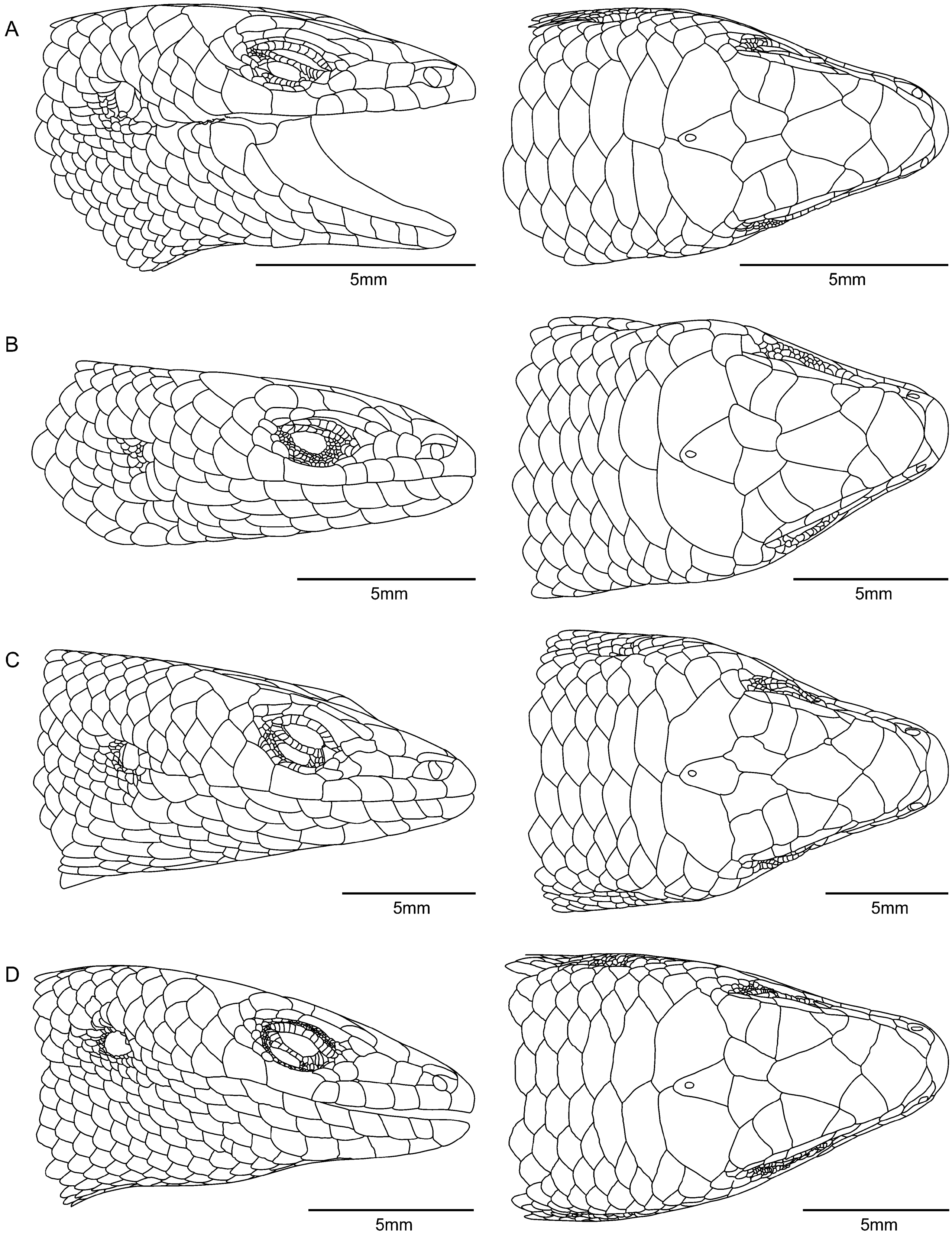

FIGURE 64. Head scalation in species of the Genus *Spondylurus* (left, side view; right, dorsal view). (A) *S. haitiae* **sp. nov.** (MCZ R-3617, holotype); (B) *S. lineolatus* (MCZ R-156938); (C) *S. macleani* (MCZ R-182270, paratype); and (D) *S. magnacruzae* **sp. nov.** (ZMUC-R 100, holotype).

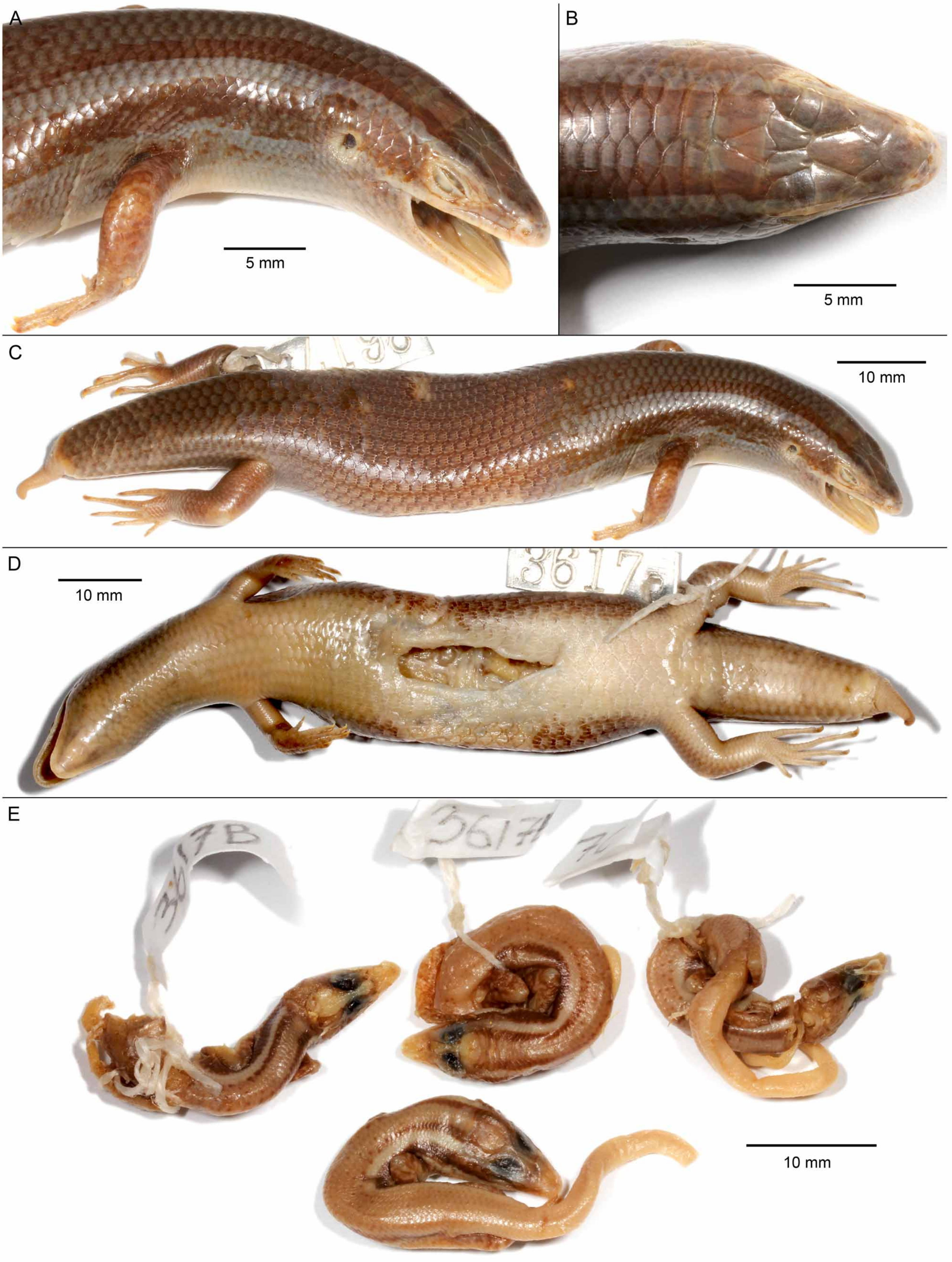

FIGURE 65. *Spondylurus haitiae* **sp. nov.**, from Hispaniola. (A–D) MCZ R-3617, holotype, near Jérémie, Haiti. E, fetuses of MCZ R-3617.

Holotype. MCZ R-3617, an adult female from "San Domingo" collected by D. F. Weinland, here restricted to Jérémie, Grand'Anse, Haiti. Date of collection inferred to be 1857–58 (see Remarks).

Paratypes (n = 4). Haiti. MCZ R-189392–395, fetuses from the holotype.

Diagnosis. *Spondylurus haitiae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in female holotype, 85.2 mm; (3) snout width, 2.69% SVL; (4) head length, 15.8% SVL, (5) head width, 12.3% SVL; (6) ear length, 1.19% SVL; (7) toe-IV length, 9.01% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, one (50%), two (50%); (12) supralabial below the eye, six; (13) nuchal rows, two; (14) dorsals, 59–60; (15) ventrals, 69–72; (16) dorsals + ventrals, 129–131; (17) midbody scale rows, 30–32; (18) finger-IV lamellae, 12–13; (19) toe-IV lamellae, 16–17; (20) finger-IV + toe-IV lamellae, 29–30; (21) supranasal contact, Y (50%), N (50%); (22) prefrontal contact, Y (50%), N (50%); (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. haitiae* **sp. nov.** is separated from *S. culebrae* **sp. nov.**, *S. fulgidus*, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a smaller ear (ear length 1.19% SVL versus 1.23–2.83% in those other species). It differs from *S. fulgidus*, *S. lineolatus*, *S. macleani*, *S. nitidus*, *S. powelli* **sp. nov.**, *S. sloanii*, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a higher number of ventral scales (69–72 versus 55–68 in those other species). From *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, and *S. semitaeniatus*, it is distinguished by having a narrower dark dorsolateral stripe (dorsolateral stripe width 2.12% SVL versus 2.24–4.64% SVL in those other species). It differs from *S. culebrae* **sp. nov.**, *S. fulgidus*, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, and *S. semitaeniatus* by having a shorter head (head length 15.8% SVL versus 15.9–21.6% SVL in those other species). From *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov** and *S. spilonotus*, it is distinguished by having wider dark dorsolateral stripes (dorsolateral stripe width 2.12% SVL versus 1.16–2.09% SVL in those other species). It is separated from *S. lineolatus* by having two dark dorsolateral stripes and two dark lateral stripes (versus 10 dark stripes in *S. lineolatus*). It differs from *S. nitidus* by having a shorter toe-IV (toe-IV length 9.01% SVL versus 9.45–12.7% SVL in *S. nitidus*). From *S. semitaeniatus*, it is separated by having a shorter head (head length 15.8% SVL versus 15.8–19.4% SVL in *S. semitaeniatus*).

Besides those non-overlapping differences, there are frequency differences separating *Spondylurus haitiae* **sp. nov.** from other species. From *S. anegadae* **sp. nov.** it differs by having a smaller ear (ear length 1.19% SVL versus 1.23–2.10% in 88% of specimens belonging to *S. anegadae* **sp. nov.**). It differs from *S. caicosae* **sp. nov.** by having a higher number of dorsals + ventrals (dorsals + ventrals 129–131 versus 113–127 in 95% of specimens belonging to *S. caicosae* **sp. nov.**) and by having a smaller ear (ear length 1.19% SVL versus 1.26–2.18% SVL in 92% of specimens belonging to *S. caicosae* **sp. nov.**). Besides the three diagnostic characters noted above, which separate *S. haitiae* **sp. nov.** from *S. nitidus* (the taxon with which it has been confused), it also has a greater number of dorsals + ventrals: 129–131 versus 117–127 in 12 specimens of *S. nitidus* (except for one specimen with 129).

Description of holotype (Figs. 64A, 65). An adult female in poor state of preservation posteriorly (soft), with ventral and lateral midbody injuries, abdominal slit, and disappearance of pattern (scale clearing) in posterior half of body. SVL 85.2 mm; tail length 28.4 mm (regenerated); HL 13.5 mm; HW 10.5 mm; SW 2.29 mm; EL 1.01 mm; and toe-IV length 7.68 mm; ear-opening small in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact (but close), contacting anteriormost loreal. Frontonasal pentagonal and lanceolate, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, and frontal. Frontal heptagonal and lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Four moderately enlarged scales behind eye on the right and five on the left comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 60 in a longitudinal row; ventrals similar to dorsals; 72 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs and on regenerated portion of tail. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 16 under toe-IV. Four preanals larger than adjacent ventral scales. Enlarged median subcaudal scales on regenerated portion of tail.

Pattern and coloration. Cochran (1941) described the pattern in this specimen when it was in better condition, so we first quote from her account: "Above bronze green, with a pale dorsolateral band extending from the supranasals over the supraciliaries to the middle of the body, where it gradually disappears; this band is bordered above by a narrow dark stripe and below by a broader dark brown band over ear and shoulder, gradually becoming lighter and disappearing on the groin; labials dark edged; a short light stripe beginning on the upper lip, passing beneath the ear, reaching the shoulder and fading out on the sides; lower parts pale bluish gray." Presently, the dorsal ground color is medium grayish-brown with dark brown spots, distributed on body and tail. Forelimbs brown with darker brown mottling on dorsal surfaces and patternless on ventral surfaces. Hindlimbs without spots or mottling. Dark dorsolateral stripes present, narrow (1.81 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown with pale spots, extending from loreal region at least to first third of body, where no pattern remains due to poor preservation. Pale middorsal stripe present, wide (2.83 mm), grayish-brown, extending from tip of snout to at least first third of body. Pale dorsolateral stripes present, pale gray—noticeably paler than middorsal stripe, and especially so in photograph in Cochran (1941)—extending from tip of snout at least to first third of body. Pale lateral stripes present, whitish, extending from below ear at least to first third of body, bordered below by irregular brown spots. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. There is no information on color in life of the holotype.

Variation. In coloration and scalation, the fetuses all resembled the holotype (Tables 4–5).

Distribution. The species is known only from the type-locality of Jérémie, Haiti (Fig. 9B).

Ecology and conservation. There are no ecological data known for this species, and it has not been collected since the holotype was taken in 1857–58. As with declines in other species of skinks in the late 19th and early 20th centuries, this species was likely affected by the introduction of the mongoose. Jérémie is located on the Tiburon Peninsula of Haiti, and in that region (Massif de la Hotte and foothills) there are small patches of original forest, even at low elevations (where dissected limestone substrate makes agriculture difficult), and therefore it is not possible to say with certainty that this species is extinct. The persistence of the other two Hispaniolan species, *Mabuya hispaniolae* **sp. nov.** and *Spondylurus lineolatus*, to at least 1937 and 1985 (respectively), demonstrates that the introduction of the mongoose did not result in immediate extinction of all skink species on the island.

The FAO (2005) lists total forest area of Haiti as 4.0% and Dominican Republic as 28.4%, but these numbers are inflated because their definition of total forest includes areas with up to 90% of the trees missing (10% canopy). Primary forest area values are not listed by FAO for these countries, but where they are listed elsewhere, they average 10–20% of total forest (Hedges 2006a). Therefore the primary forest of Haiti is likely < 1% of total land area, and that of the Dominican Republic, ~5% of land area. There are national parks and protected areas in Haiti and the Dominican Republic, but deforestation takes place within park boundaries, and therefore they do not afford protection.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus haitiae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Other major threats include habitat destruction from agriculture and charcoaling, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands. All mongoose-free islets of Hispaniola need to be thoroughly surveyed to determine if this species, or the other two species of mabuyines from Hispaniola, still exist.

Reproduction. The holotype (85.2 mm SVL) contained four well-developed fetuses, designated here as paratypes. No specific date (month) of collection is available.

Etymology. The species name (*haitiae*) is a feminine genitive singular noun derived from the Amerindian (Taino) name for the entire island of Hispaniola, transliterated in English as "Haiti" or "Hayti," meaning "high mountains."

Remarks. This specimen was originally a syntype of *Mabuia nitida* Garman. Stejneger (1904) placed that species in the synonymy of *Mabuya sloanii*. Schmidt (1928) retained "*Mabuya nitida*" in the synonymy of *M. sloanii* but noticed that this syntype from Hispaniola differed from the Puerto Rican syntypes (and other specimens from Puerto Rico) sufficiently that he restricted the name "*Mabuya nitida*" to Puerto Rico, should the species ever be considered valid (as it is here). Garman (1887) listed the type-locality of the species as "Porto Rico and San Domingo" (MCZ R-3617 representing "San Domingo"). The name "San Domingo" has been interpreted by subsequent authors, and the MCZ, as pertaining to the city of Santo Domingo, Dominican Republic, and global databases have used the GPS coordinates for the city, as the locality. However, this place name (and "Santo Domingo") was commonly applied to the entire island of Hispaniola during the nineteenth century, as was the name "Haiti" or "Hayti" (Keim 1870; Barbour 1914; see historical maps in Hedges 2011). "San Domingo," to a lesser extent, was also a name used for the newly independent country now called the Dominican Republic during the late nineteenth century (other names for the country were "Dominica" and "Santo Domingo"). To distinguish the city of Santo Domingo from the country or island, the word "city" was usually used (e.g., "San Domingo city"), and therefore it is nearly certain that Garman was not referring to the city of Santo Domingo. He did not list a collector (perhaps for brevity because there were multiple syntypes and collectors), but the MCZ records the collector as "D. F. Weinland," with no date of collection or other information.

David Friedrich Weinland was a German zoologist and collector of animals who spent six months in Jérémie, Haiti, during 1857–58 (Weinland 1858). The MCZ collections record 475 specimens (various animals) associated with his name. Of the large number from Caribbean locations, nearly all are from Jérémie, Haiti, as would be expected. A few are from other specific locations in the country of Haiti, and two snails are from the Bahamas. Barbour's (1914) reference to "Haitian" material of *Spondylurus sloanii* is uninformative for our purpose because he preferred to use the original Taino name for the entire island (Haiti). Cochran (1941) examined this specimen, referring to the type locality variously as "San Domingo" and "Santo Domingo" and noting a collection date of 1859, information not currently associated with the specimen (and a year after Weinland left the island). Because (1) "San Domingo" or "Santo Domingo" was the common name for the entire island at the time of Weinland and Garman, (2) there is no evidence that Weinland ever collected in the Dominican Republic, and (3) nearly all of his specimens came from the vicinity of Jérémie, Haiti, we have restricted the type-locality of this species to Jérémie, Haiti, with a collection date of 1857–58. Cochran's date of 1859 was probably the date that the specimen was received at MCZ.

Cochran (1941) concluded that MCZ R-3617 was "very similar" to specimens that we place here in another species (*M. hispaniolae* **sp. nov.**) and genus (*Mabuya*). However her table of characters for the specimens shows the major differences in ventrals and nuchals that separate the two species. Cochran indicated three supraoculars in MCZ R-3617, but it has four, another character separating it from *M. hispaniolae* **sp. nov.** Other diagnostic characters are noted above. Two photographs of the holotype of *Spondylurus haitiae* **sp. nov.** are shown, as "*Mabuya mabouya sloanii*," in Cochran (1941). With its mouth preserved in open position, and precise details of pattern matching, it is clearly the same animal that we examined, but the pattern is strikingly bold, compared with its much faded current state. Cochran (1941) also made no mention of its poor state of preservation and described pattern in the posterior half of the body, which is now soft and patternless (scales cleared). Apparently the specimen was in excellent condition after its first 80 years but suffered significant damage in its second 80 years.

A specimen in the Slater Museum (PSM 10269), labeled as *Mabuya mabouya* from Restauración, Dominican Republic, was examined by us and found to be *Celestus costatus* (Anguidae). Also BMNH 1982.1448 from Port-au-Prince Haiti, cataloged as *Mabuya mabouya*, is not a skink and probably a *Celestus* as well (Colin McCarthy, BMNH, personal communication).

Spondylurus lineolatus (Noble & Hassler 1933) comb. nov.

Hispaniolan Ten-lined Skink
(Figs. 55F, 64B, 66)

Mabuya lineolata—Noble & Hassler, 1933:16. Holotype: AMNH 42145, female, from Monte Cristi, Dominican Republic, 8 January 1930, collected by W. G. Hassler.
Mabuya lineolata—Dunn, 1936:550.
Mabuya lineolata—Barbour, 1935:129.
Mabuya lineolata—Barbour, 1937:147.
Mabuya lineolata—Cochran, 1941:303.
Mabuya lineolata—Schwartz & Thomas, 1975:140.
Mabuya lineolata—MacLean *et al.*, 1977:24.
Mabuya lineolata—Henderson & Schwartz, 1984:24.
Mabuya lineolata—Schwartz & Henderson, 1988:150.
Mabuya lineolata—Schwartz & Henderson, 1991:455.
Mabuya lineolata—Powell *et al.*, 1996:82.
Mabuya lineolata—Henderson & Powell, 2009:292.

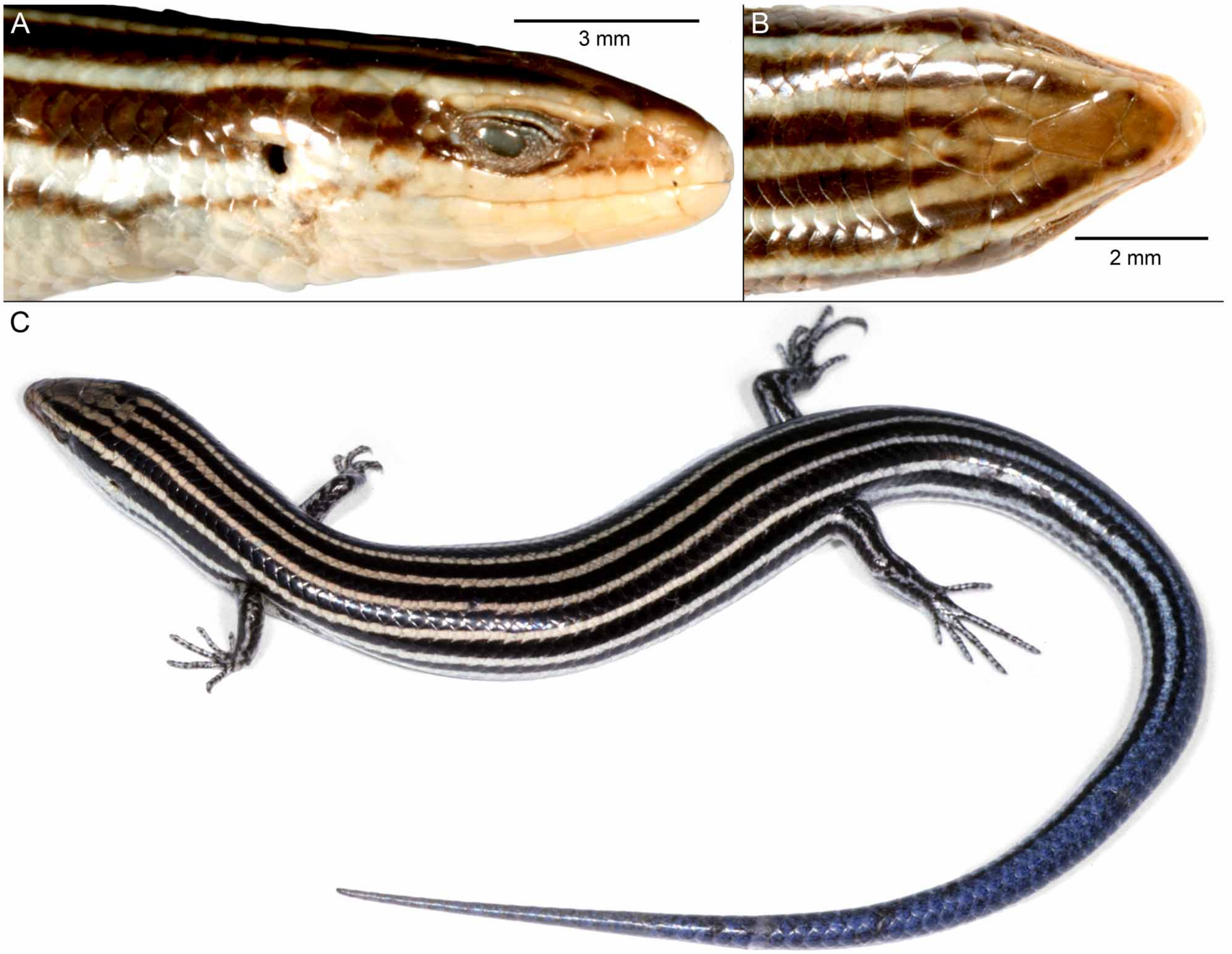

FIGURE 66. *Spondylurus lineolatus*, from Hispaniola. (A–B) MCZ R-156938, 10.6 km W Ca Soleil, Haiti. (C) USNM 329347, 10.4 km NW Ca Soleil, Haiti (live individual, photographed by S. B. Hedges, 18 July 1985).

Material examined (n = 10). Dominican Republic. KU 242008, Albert Schwartz, Monte Cristi, Cana (23 km NW Mao), 30 October 1971. Haiti. KU 242001–02, Albert Schwartz, Artibonite, 5.6 km W ça Soleil, 10–12 July 1978; KU 242003–04, Albert Schwartz, Artibonite, 10.6 km W ça Soleil, 21 July 1979; KU 242005 (5 August 1978), KU 242006 (20 July 1979), KU 242007 (no date), Albert Schwartz, Artibonite, 1.9 km W Ennery, 333 m; MCZ R-156938, Albert Schwartz, Artibonite, 10.6 km W ça Soleil, 121 m, 11 July 1978; USNM 329347, S. B. Hedges & R. Thomas, 10.4 km NW ça Soleil, Haiti, 130 m, 18 July 1985.

Material not examined (n = 3). Dominican Republic. AMNH 42145 (holotype), AMNH 57165–66 (paratypes), W. G. Hassler, Monte Cristi (near the bank of the Rio Yaque del Norte), 8 January 1930.

Diagnosis. *Spondylurus lineolatus* is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 63.7 mm; (3) snout width, 1.97–2.34% SVL; (4) head length, 12.9–14.4% SVL; (5) head width, 9.58–11.6% SVL; (6) ear length, 1.18–1.69% SVL; (7) toe-IV length, 7.23–9.16% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, three (63%), four (38%); (11) frontoparietals, two; (12) supralabial below the eye, four (11%), five (89%); (13) nuchal rows, one (44%), two (56%); (14) dorsals, 57–67; (15) ventrals, 59–67; (16) dorsals + ventrals, 116–134; (17) midbody scale rows, 26–28; (18) finger-IV lamellae, 8–11; (19) toe-IV lamellae, 11–16; (20) finger-IV + toe-IV lamellae, 21–26; (21) supranasal contact, Y (44%), N (56%); (22) prefrontal contact, Y (11%), N (89%); (23) supraocular-1/frontal contact, Y (11%), N (89%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, dark (Tables 3–5).

Spondylurus lineolatus differs from all other species in the Genus *Spondylurus* by having a smaller head (head length 12.9–14.4% SVL versus 15.0–21.6% SVL in other species) and by having 10 dark dorsal stripes (versus 2–6 stripes).

Description of material. Five adult females, five juveniles in excellent state of preservation, without injuries and with an abdominal slit in each adult. SVL 34.9–63.7 mm; tail length 7.34–74.2 mm (broken or regenerated); HL 6.41–8.64 mm; HW 4.48–6.61 mm; SW 0.90–1.49 mm; EL 0.63–0.95 mm; and toe-IV length 3.36–5.26 mm; ear-openings average in size and round or oval; toe length in the following order: I < V < II < III < IV or I < II < V < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact or not, sometimes contacting anteriormost loreal. Frontonasal heptagonal and lanceolate, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated or in contact medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary (rarely), first (and sometimes second) supraoculars, and frontal. Frontal hexagonal or heptagonal, in contact with the second (and sometimes first) supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Three or four supraciliaries, the first (where three are present) or second (where four are present) the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal, and first supralabial (and frontonasal, where supranasal-anterior loreal contact is absent). Anterior and posterior loreals squarish with posteromedial projection on latter, in some cases. One to three upper preoculars and two lower preoculars. Six to seven supralabials, the fourth or fifth being the widest and forming the lower border of the eyelid. Three to six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Six or seven infralabials. Mental scale wider than long, posterior margin straight or curved toward tip of snout. Postmental scale and one or two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second (and sometimes third) pair(s) separated by a smaller cycloid scale.

Body and limb scalation. One to two rows of paired or unpaired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 57–67 in a longitudinal row; ventrals similar to dorsals; 59–67 in a longitudinal row; 26–28 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portions of tails, one wide row of scales present on ventral surfaces. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 8–11 under finger-IV and 11–16 under toe-IV. Four to six preanals similar to ventrals or larger than adjacent ventral scales. Enlarged median subcaudal scales on regenerated portions of tails.

Pattern and coloration. Dorsal ground color pale to medium gray with 10 dark brown stripes extending from head to tail. Stripes cover dorsal and lateral body surfaces, the two (or, in some cases, four) most ventral stripes intersecting the axilla. Limbs also pale to medium gray with dark brown stripes. Ventral surface without pattern on the body and with two dark brown stripes on the tail. Palmar and plantar surfaces dark brown.

Color in life: Noble and Hassler (1933) described the coloration of the type series in life: "the dark stripes were nearly black while the light ones were lemon-yellow, changing into bluish at the tail-base. The tail was blue and the whole color pattern greatly resembled that of *Ameiva lineolatus* Duméril and Bibron."

Distribution. The species is distributed on Hispaniola, in northern Haiti and northwestern Dominican Republic (Fig. 9B).

Ecology and conservation. The ça Soleil localities are in a xeric coastal region receiving less than 75 cm of rainfall per year, whereas the other localities are somewhat more mesic (75–150 cm rainfall). Virtually nothing is known of the habits of this species except that specimens were found under objects on the ground. Remarkably, it has not been seen since 1985 despite the considerable herpetological survey work that has taken place on the island since then. As with declines in other species of mabuyine skinks in the late 19th and early 20th centuries, this species was almost certainly affected by the introduction of the mongoose. The persistence of *Spondylurus lineolatus* to (at least) the late 20th century, and of *Mabuya hispaniolae* **sp. nov.** to at least 1937, demonstrates that the introduction of the mongoose may not necessarily cause immediate extinction. However, neither species was ever commonly encountered, suggesting that their populations were negatively affected long before they were last observed. Shortly after *S. lineolatus* was discovered, Barbour (1937) noted, "it must be very rare to have eluded collectors for so long. The mongoose is abundant in San Domingo [= Hispaniola] to be sure, but the early collectors all failed to find the skink."

Deforestation is a continuing threat in Hispaniola. See comments regarding the estimation of forest cover, in Remarks for *Spondylurus haitiae* **sp. nov.** The primary forest of Haiti is likely < 1% of total land area, and that of the Dominican Republic, ~5% of land area. There are national parks and other protected areas in Haiti and the Dominican Republic, but deforestation takes place within park boundaries, and therefore they do not afford complete protection, or sometimes, even partial protection.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus lineolatus* to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has possibly led to its extinction. Other major threats include habitat destruction from agriculture and charcoaling, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands. All mongoose-free islets of Hispaniola need to be thoroughly surveyed to determine if this species, or the other two species of mabuyines from Hispaniola, still exist.

Reproduction. Two females (56.2–63.7 mm SVL) each contained two young. The dates of collection for those specimens were 21 July 1979 and 5 August 1978.

Etymology. Not provided in the original description. However, the species name (*lineolatus*) is a feminine singular adjective derived from the Latin *linea* (line), hence lined, referring accurately to the lineate dorsal pattern of this species.

Remarks. The molecular phylogeny shows that *Spondylurus lineolatus* is a member of the Genus *Spondylurus*, which agrees with its multiple nuchal scales and distribution in the northern Caribbean. However, in pattern it differs strikingly from other species in the genus. As noted by Noble and Hassler (1933), it resembles, very closely, a sympatric and similarly pin-striped and blue-tailed species of teid lizard, *Ameiva lineolata*. The two species are virtually identical in body size and have blue tails as adults (blue tails are present only in juveniles of many other lizard species). Stripes are common in animal coloration, providing crypsis, and the consensus on blue tails in lizards is that they have an antipredator function, drawing attention away from the head (Cooper 1985; Hawlena *et al.* 2006; Bateman & Fleming 2008). This is the most likely explanation for why these lizards resemble one another. If mimicry is involved, the likely mimic would be the skink because its pattern differs the most from its congeners. Also, *Ameiva* have proportionately larger heads than skinks and will bite at predators (at least fingers of collectors) fiercely. Thus *S. lineolatus* might gain a slight advantage by resembling *Ameiva lineolata* in an encounter with a small predator.

Spondylurus macleani **(Mayer & Lazell 2000) comb. nov.**
Carrot Rock Skink
(Figs. 55G, 64C, 67)

Mabuya mabouya sloanii—Mayer & Lazell, 1988:23 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya macleani—Mayer & Lazell, 2000:871. Holotype: MCZ R-170884, Carrot Rock, south of Peter Island, British Virgin Islands, 18° 19' 45" N, 64° 34' 18" W, James D. Lazell, Jr., 13 July 1985.
Mabuya macleani—Miralles, 2005:51.
Mabuya macleani—Henderson & Powell, 2009:293.

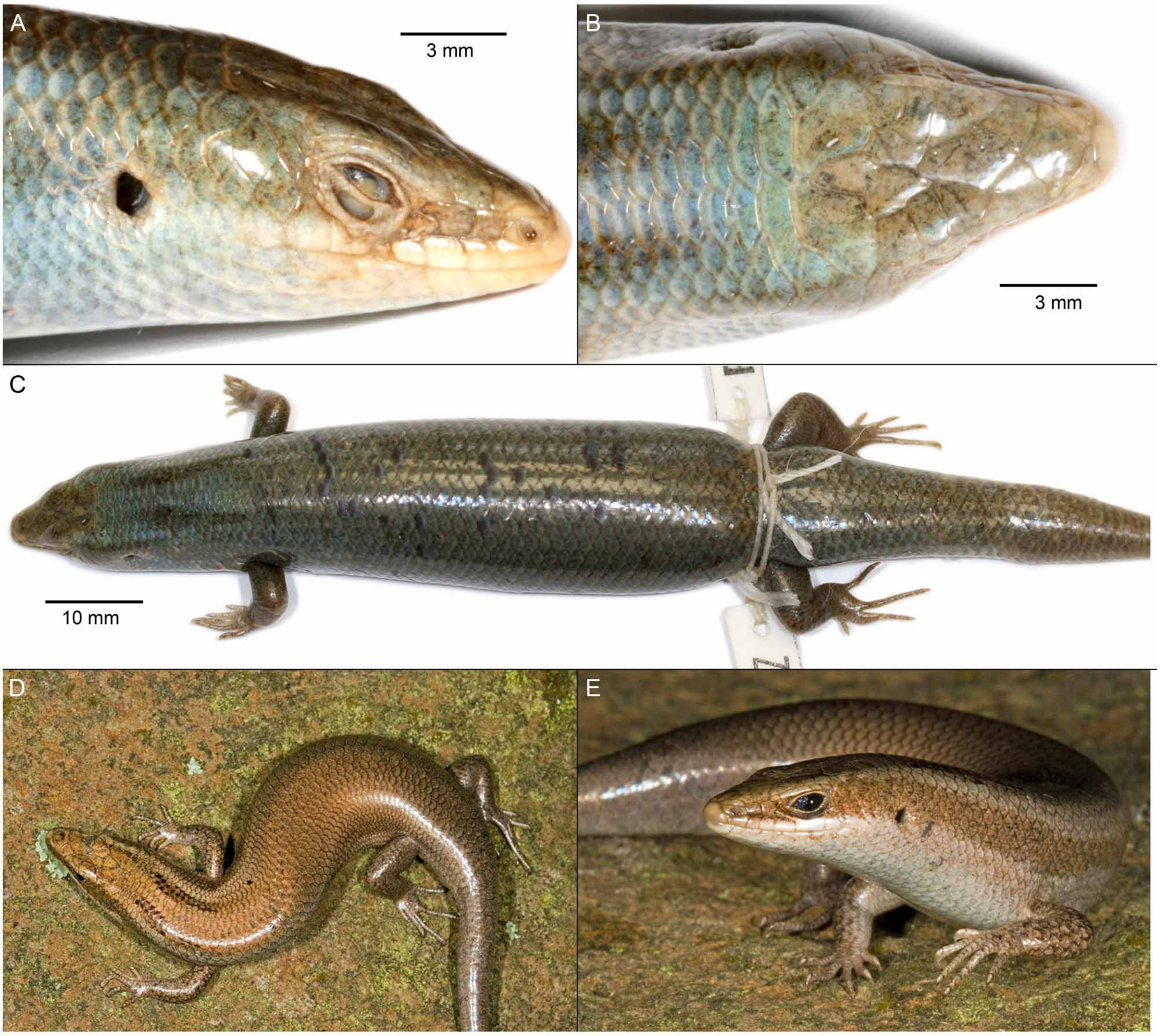

FIGURE 67. *Spondylurus macleani*, from Carrot Rock, British Virgin Islands. (A–C) MCZ R-182270, paratype, Carrot Rock (no specific locality). (D–E) uncataloged (live individual, photographed by A. Sanchez).

Material examined (n = 5). Carrot Rock, British Virgin Islands. MCZ R-176728 (paratype), M. Hernandez and F. Krause, 26 October 1991; MCZ R-182270–72 (paratype), R. Jenkins and L. Drew, 17 July 1988; USNM 576303, June 2007.

Material not examined (n = 2). Carrot Rock, British Virgin Islands. MCZ R-170884 (holotype), James Lazell, 13 July 1985; UMMZ 197261 (paratype), Fred Kraus, 26 October 1991.

Diagnosis. *Spondylurus macleani* is characterized by (1) maximum SVL in males, 75.5 mm; (2) maximum SVL in females, 79.6 mm; (3) snout width, 2.47–3.09% SVL; (4) head length, 16.0–17.5% SVL; (5) head width, 12.1–13.8% SVL; (6) ear length, 1.29–1.52% SVL; (7) toe-IV length, 8.22–10.5% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, three (20%), four (60%), five (20%); (11) frontoparietals, two; (12) supralabial below the eye, five (40%), six (60%); (13) nuchal rows, one (20%), two (80%); (14) dorsals, 62–65; (15) ventrals, 62–64; (16) dorsals + ventrals, 125–127; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 12–14; (19) toe-IV lamellae, 15–18; (20) finger-IV + toe-IV lamellae, 28–31; (21) supranasal contact, Y (60%), N (40%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (20%), N (80%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y (faint); (27) dark lateral stripe, Y (very faint); (28) pale lateral stripe, N; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. macleani* differs from all other species except *S. anegadae* **sp. nov.** and *S. turksae* **sp. nov.** by having short and faded dorsolateral and dark lateral stripes, and essentially no dorsal pattern posterior to those stripes. From *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii*, it differs by having a wider middorsal stripe (3.14–3.96% SVL versus 0.953–2.81% in those other species). It differs from *S. haitiae* **sp. nov.** and *S. fulgidus* by having a higher number of dorsal scales (62–65 versus 52–60 in those other species). It differs from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having a higher dark dorsolateral stripe width/middorsal dark stripe width ratio (0.608–0.916 versus 0.276–0.464 in those other species). From *S. culebrae* **sp. nov.**, it differs by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.608–0.916 versus 0.953–2.24 in *S. culebrae* **sp. nov.**). It is distinguished from *S. lineolatus* by having a higher number of finger-IV lamellae (12–14 versus 8–11 in *S. lineolatus*). It is separated from *S. martinae* **sp. nov.** by having a lower number of ventrals (62–64 versus 68–71 in *S. martinae* **sp. nov.**). It differs from *S. turksae* **sp. nov.** in having more midbody scale rows (32–34 versus 30).

Frequency differences also separate *Spondylurus macleani* from other species within the genus. It is separated from *S. caicosae* **sp. nov.** by having a higher number of midbody scale rows (32–34 versus 27–31 in 94% of specimens belonging to *S. caicosae* **sp. nov.**). It differs from *S. monitae* **sp. nov.** by having a lower frequency of supraocular-1/frontal contact (no contact in 80% of specimens versus contact in 86% of specimens belonging to *S. monitae* **sp. nov.**). It is separated from *S. nitidus* by having a smaller head (head length 16.0–17.0% SVL in 80% of specimens versus 17.4–20.7% SVL in 87% of specimens belonging to *S. nitidus*) and by having a shorter toe-IV (toe-IV length 8.22%–9.26% SVL in 80% of specimens versus 10.1–12.7% SVL in 93% of specimens belonging to *S. nitidus*). It is distinguished from *S. powelli* **sp. nov.** by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (0.608–0.916 versus 0.232–0.606 in 87% of specimens belonging to *S. powelli* **sp. nov.**).

Description of material. Three adult females and two adult males in excellent state of preservation, without injuries and with an abdominal slit. SVL 64.5–79.6 mm, our measurements differing only slightly from those of Mayer and Lazell (2000); tail length 10.7–76.2 mm (regenerated, broken, or complete); HL 10.8–13.2 mm; HW 8.67–10.4 mm; SW 1.73–2.33 mm; EL 0.83–1.17 mm; toe-IV length 5.90–7.11 mm; ear-openings average in size and round; fingers and toes clawed; toe length in the following order: I < V < II < III < IV or I < V = II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in or not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary (in some cases), first (and sometimes second) supraoculars, and frontal. Frontal heptagonal, in contact with the second (and sometimes first) supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate or acorn-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Three to five supraciliaries, the first or second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish or rectangular with posterodorsal or posteromedial projection on latter (in some cases). Two or three upper preoculars and two lower preoculars. Seven or eight supralabials, the fifth or sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Six or seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale (if it is present).

Body and limb scalation. One or two rows of paired or unpaired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62–65 in a longitudinal row; ventrals similar to dorsals; 62–64 in a longitudinal row; 32–34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portions of tails, one enlarged row each of middorsal and midventral scales and lateral rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 12–14 under finger-IV and 15–18 under toe-IV. Preanal scales similar to ventrals. Enlarged or no enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color pale bluish-gray without dark brown spots. Dark dorsolateral stripes present, narrow (1.52–2.08 mm), dark brown, extending from nuchal area to forelimbs. Dark lateral stripes, tan and weakly defined, extending from loreal region to forelimbs or first third of body. Pale middorsal stripe present, wide (2.27–3.04 mm), pale bluish-gray, extending from nuchal area to forelimbs. Pale dorsolateral stripes present, pale bluish-gray, extending from top of head to forelimbs. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented.

Color in life: The holotype, in life, was described by Mayer and Lazell (2000) as being pallid beige-gray with lead-gray dark dorsolateral stripes. That color description applies to another live individual (Fig. 67D–E) and indicates that the bluish color of preserved specimens is an artifact of preservation.

Distribution. The species is known only from Carrot Rock (0.013 km^2, 25 m) in the British Virgin Islands (Fig. 10E).

Ecology and conservation. Carrot Rock is a tiny jumble of rocks with a few small clumps of vegetation, including small trees (Sea Grape, *Coccoloba uvifera* Linnaeus), several species of cacti, and some vines and grass (Lazell 1983; Mayer & Lazell 2000). The observation by Grant (1932a), for Puerto Rico, that the favorite hiding place of mabuyine skinks is in dense clumps of cactus, probably applies here as well. In 1988, the total number of individuals of this species was estimated to be 520, based on extrapolation from a sample of eight (Mayer & Lazell 2000). Skink abundance plummeted by the mid-1990s as a result of severe droughts and hurricanes, and population levels never fully recovered. Subsequently, only 2–3 individuals have been sighted during two-hour visits to the island (Mayer & Lazell 2000). Based on this anecdotal evidence, the total number of individuals of *Spondylurus macleani* is likely less than 200 (James D. Lazell, personal communication). Given the existing small population size, any future climate change is likely to cause major changes in the skink population as well, and enhanced change as a result of anthropogenic factors could lead to extinction. Also, the probability of human introduction of pests (e.g., rats, invertebrates) that might cause direct or indirect negative effects on the skink population is not insignificant given the proximity of the island to Peter Island (400 m away) and the prevailing winds and currents. The island is currently unprotected, and anyone can visit it.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus macleani* as Endangered (EN D). It faces a primary threat from predation by invasive mammals, including black rats, and other pests likely to colonize the island, and a secondary threat from habitat alteration resulting from human activities (the island is unprotected) and from global warming in coming decades. Studies are needed to determine the health of the population, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. No data on reproduction are available for this species.

Etymology. The species (*macleani*) was named in honor of William P. MacLean III (1943–1991) for his contributions to the herpetology of the Virgin Islands (Mayer & Lazell 2000).

Remarks. The small island of Carrot Rock may be no more than 3000 years old (Lazell 1983; Mayer & Lazell 2000). This might seem like too short a time for an endemic species of lizard to evolve, but the island is also the only known locality for another distinct lizard species, *Anolis ernestwilliamsi* Lazell (1983). The simplest and most likely hypothesis is that they evolved in isolation on Carrot Rock in the last few thousand years. An alternative, but more complex, hypothesis is that they are relict populations of widely distributed species that have since disappeared elsewhere. The timetree (Fig. 7) shows that *S. macleani* split from other species in the Puerto Rico region in the Pleistocene (0.7 Ma), not Holocene, but the Bayesian credibility interval is wide, as expected given the small data set and calibrations. A more detailed analysis with a larger data set would be needed to discriminate among such small intervals of time (< 1 Ma).

***Spondylurus magnacruzae* sp. nov.**
Greater Saint Croix Skink
(Figs. 55H, 64D, 68)

Mabouia aenea—Günther, 1859:212 (part).
Mabuia sloanii—Boulenger, 1887:193 (part).
Mabuya sloanii—Barbour, 1914:355 (part).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya sp.—Grant, 1937:512 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al*., 1977:35 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al*., 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. ZMUC-R 100, from St. Croix, U.S. Virgin Islands, collected by "Mr. Hartmann" and accessioned 30 January 1883. An old, apparently original, label attached to the specimen with handwriting that has almost completely faded says: "*Eumeces agilis*, St. Croix, [Mai?] 1882, 30/1.83.v.8." This suggests that the collection date was in 1882.

Paratypes (n = 9). St. Croix, U.S. Virgin Islands. BMNH 59.3.14.18–21, collected before 14 March 1859 (no specific locality or collector available); KU 242174, Richard Thomas (personal communication), Green Cay, 6 August 1964; ZMUC-R 98, "Mr. Eggers," no specific locality, accessioned 7 October 1875. See **Remarks.** No specific locality. ANSP 9401, metal tag (plastic tag indicates "9410"), "West Indies," no date, collected by Dr. H. C. Chapman (probably prior to 1862 based on accession number); BMNH (no number or date, but probably mid–19th century), "St. Croix?" (no additional collection information available); ZMUC-R 95, "West Indies," accessioned 30 March 1845 (no collector information available).

Diagnosis. *Spondylurus magnacruzae* **sp. nov.** is characterized by (1) maximum SVL in males, 92.9 mm; (2) maximum SVL in females, 107 mm; (3) snout width, 2.29–2.97% SVL; (4) head length, 15.9–18.0% SVL; (5) head width, 11.3–14.3% SVL; (6) ear length, 1.49–1.72% SVL; (7) toe-IV length, 7.01–10.4% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five (11%), six (89%); (13) nuchal rows, one (44%), two (56%); (14) dorsals, 60–65; (15) ventrals, 59–70; (16) dorsals + ventrals, 119–134; (17) midbody scale rows, 34; (18) finger-IV lamellae, 12–14; (19) toe-IV lamellae, 16–18; (20) finger-IV + toe-IV lamellae, 28–31; (21) supranasal contact, Y (22%), N (78%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, N; (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. magnacruzae* **sp. nov.** is distinguished from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. macleani*, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.276–0.375 versus 0.500–3.79 in those other species). It differs from *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. nitidus*, and *S. turksae* **sp. nov.** by having a higher number of midbody scale rows (34 versus 26–33 in those other species). It is separated from *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. macleani*, *S. powelli* **sp. nov.**, and *S. semitaeniatus* by having a pale lateral stripe continuous to the hindlimbs. From *S. fulgidus*, it differs by having a lower number of supraciliaries (four versus five in *S. fulgidus*). It differs from *S. lineolatus* by having a larger head (head length 15.9–18.0% SVL versus 12.9–14.4% in *S. lineolatus*) and four dark stripes instead of ten.

In terms of slightly overlapping (frequency) traits, it is separated from *S. monae* **sp. nov.** by having a higher number of midbody scale rows (34 versus 28–33 in 91% of specimens belonging to *S. monae* **sp. nov.**). From *S. monitae* **sp. nov.**, it differs by having a higher number of supralabials (supralabial 6 below the eye in 89% of specimens of *S. magnacruzae* **sp. nov.** versus supralabial 5 below the eye in all *S. monitae* **sp. nov.**). It is distinguished from *S. powelli* **sp. nov.** by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.276–0.375 versus 0.389–0.762 in 87% of specimens belonging to *S. powelli* **sp. nov.**).

Spondylurus magnacruzae **sp. nov.** most closely resembles *S. spilonotus*, which occurs (or occurred) on St. Thomas and St. John. Both species reach 107 mm SVL in the relatively small samples available, making them the largest species in the Genus *Spondylurus*. They also have a similar general pattern consisting of narrow dark dorsolateral stripes in the anterior portion of the body. However, *S. magnacruzae* **sp. nov.** has fewer dorsal body spots (3–37 versus 52–99), a longer supraciliary-1 scale (supraciliary-1/supraciliary-2 length ratio 0.52–0.69 versus 0.35–0.50; Fig. 69A), and a smaller ear (ear length 1.49–1.72% SVL versus 1.76–2.05%; Fig. 69B). Also the stripe pattern of *S. magnacruzae* **sp. nov.** appears distinctly bolder and with straighter edges to the stripes, compared with that of *S. spilonotus*, features not obviously related to age of the specimens or differences in preservation.

Description of holotype (Figs. 64D, 68A–D). An adult male in good state of preservation, without injury, and with an abdominal slit. SVL 79.5 mm; tail length 128 mm (complete); HL 13.9 mm; HW 10.3 mm; SW 2.36 mm; EL 1.19 mm; and toe-IV length 6.52 mm; ear-opening average in size and round; fingers and toes clawed; toe length in the following order: I < V < II < III < IV.

FIGURE 68. *Spondylurus magnacruzae* **sp. nov.**, from St. Croix, U.S. Virgin Islands. (A–D) ZMUC-R 100, holotype. (E) BMNH 59.3.14.18, paratype. (F) BMNH 59.3.14.19. All from St. Croix (no specific locality within island).

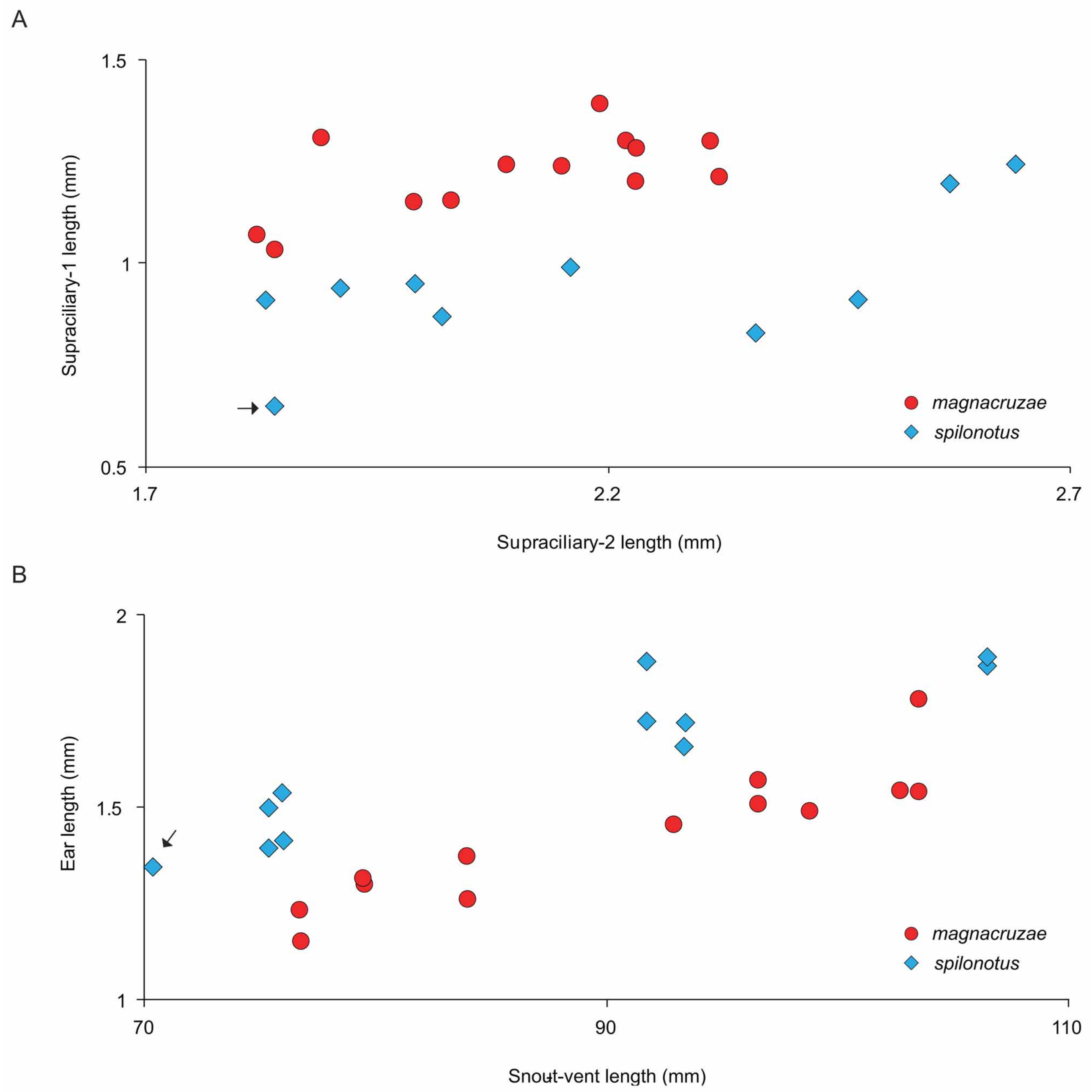

FIGURE 69. Graphs of two diagnostic characters distinguishing *Spondylurus magnacruzae* **sp. nov.** from *S. spilonotus*. (A) supraciliary-1 length versus supraciliary-2 length. (B) ear length versus SVL. The lectotype of *S. spilonotus* is indicated with an arrow.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary (right side only), first and second supraoculars, and frontal. Frontal heptagonal and lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. Postnasal bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Two or three upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller, except primary postocular similar in size to primary temporal. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 60 in a longitudinal row; ventrals similar to dorsals; 65 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 17 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium greenish-brown with small dark brown spots distributed sparsely on limbs and on body (posterior to the dark dorsolateral stripes). Dark dorsolateral stripes present, narrow (1.31 mm), dark brown, extending from nuchal area to first third of body. Dark lateral stripes present, dark brown with paler spots increasing from the forelimbs to the hindlimbs, extending from loreal region to hindlimbs. Pale middorsal stripe present, wide (3.49 mm), greenish-brown, extending from nuchal area to first third of body. Pale dorsolateral stripes present, greenish-white, extending from behind eye to first third of body. Pale lateral stripes present, greenish-white, extending from behind ear to midbody, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces pale or slightly gray. There is no information on color in life of the holotype.

Variation. In coloration and scalation, the paratypes resembled the holotype (Tables 4–5), although some of the consensus pattern elements were more visible (Fig. 55H).

Distribution. The species is distributed on St. Croix, U.S. Virgin Islands, 230 km^2 and its satellite Green Cay (Fig. 10G).

Ecology and conservation. *Spondylurus magnacruzae* **sp. nov.** is sympatric with *Capitellum parvicruzae* **sp. nov.**, apparently a much smaller species (68 mm, only specimen), on St. Croix. The fact that it co-occurred with a smaller species makes sense from an ecological (especially trophic) standpoint, although we know essentially nothing about the ecology and behavior of these species. However, the small head and digits of *C. parvicruzae* **sp. nov.** suggest that it is (or was) more ground-dwelling than *S. magnacruzae* **sp. nov.**, which has a head and limbs more typical in proportion for the Genus *Spondylurus*. *Spondylurus magnacruzae* **sp. nov.** may have climbed trees, but it does not have the attenuate body shape and long digits of the more obviously scansorial species, *S. fulgidus* and *Alinea pergravis*. Therefore, *S. magnacruzae* **sp. nov.** probably was a species that climbed on rocks, logs, and cacti, and lived under and among them, but unlikely burrowed or lived high in trees.

In his book on St. Croix, West (1794) mentioned skinks briefly as (in error) *Lacerta sputator* (= *Sphaerodactylus sputator* Sparrman), noting only that the locals consider them to be "deadly." The four BMNH specimens were collected on St. Croix shortly before 1859 by Alfred and Edward Newton, and their notes on the collection were communicated by Günther (Günther 1859). They mentioned that the locals called the species the "slippery-back," a name still used in the English-speaking islands of the Caribbean. They considered the species to be more abundant than *Thecadactylus* (Gekkonidae) but "not often observed." Two of the four specimens were collected while copulating. No other ecological data exist on this species, and the most recently obtained specimen of *Spondylurus magnacruzae* **sp. nov.** from the main island of St. Croix was accessioned in 1883. Considerable herpetological survey work in the Virgin Islands during the 20th century failed to turn up additional specimens. The species has been found only one other time, in 1964 on Green Cay, off St. Croix, by Richard Thomas for Albert Schwartz (KU 242174). There have been no other sightings of the species on that island either, despite herpetological survey work during the last 10 years (Claudia Lombard, personal communication). The presence of the introduced mongoose on St. Croix undoubtedly explains the absence of the skink on that island today. Black rats have been a problem on Green Cay, and that may explain its apparent absence there. Habitat alteration, another threat to the species, is a continuing problem on these islands and their islets.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus magnacruzae* **sp. nov.** to be Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on large islands such as St. Croix, but may be possible on Green Cay.

Reproduction. No data on reproduction are available for this species.

Etymology. The Latin species name (*magnacruzae*) is a feminine genitive singular noun referring to the larger size of this species (*magna*, large) compared with the other species on St. Croix, *Capitellum parvicruzae* **sp. nov.**, and to its distribution. The island was named "Santa Cruz" by Christopher Columbus in 1493 and later renamed Saint Croix by the French.

Remarks. *Spondylurus magnacruzae* **sp. nov.** is probably a close relative of *S. spilonotus* because it shares several traits, noted above, and occurs on nearby islands. By chance, all of the large Virgin Islands skinks that we examined initially were of *S. magnacruzae* **sp. nov.**, from St. Croix, and we assumed that it was the long-confused and long-synonymized "*spilonotus*" of Wiegmann (1837) based on general resemblance to the ZMB holotype of that species, lacking specific locality. But we were surprised that it was given the name *spilonotus* ("spotted back") when there were few or no spots on the backs of the St. Croix material. Then, after seeing the more abundantly-spotted material from St. Thomas and St. John (ZMUC, ZMH), more closely examining the *S. spilonotus* holotype pattern (also spotted), and finding additional diagnostic scale differences, it was clear to us that two large species were involved. These two Virgin Island species, at 107 mm maximum SVL, more or less tie with *Alinea luciae* (107 mm) and *Copeoglossum aurae* **sp. nov.** (109 mm) in being the largest in the West Indies, surpassed only by *C. margaritae* **sp. nov.** (121 mm) and *C. nigropunctatum* (113 mm), in being the largest of 61 species in the Subfamily Mabuyinae.

That *Spondylurus magnacruzae* **sp. nov.** occurred on St. Croix is without dispute. Collection notes on the BMNH material were published (Günther 1859), and two of the ZMUC specimens (ZMUC-R 98, ZMUC-R 100) are identified as being from St. Croix. Specimen ZMUC-R 98 was collected, during or before 1875, by Danish army captain and naturalist Henrik Franz Alexander von Eggers. He lived on St. Croix and published a flora of the island at about that time (Eggers 1879). Eggers also collected the holotype of *Capitellum parvicruzae* **sp. nov.** (ZMUC-R 99) on St. Croix. The two species differ in many ways and belong to different genera. Maximum body size is not known in *C. parvicruzae* **sp. nov.**, but the unique specimen (68 mm SVL) is an adult, and the genus appears to be characterized by small species based on body size and small number of midbody scale rows (see Remarks for *Capitellum*). Two species listed as "probably from St. Croix," ZMUC-R 91–92, are typical of *S. spilonotus*, and we assign them to that species. They were collected by a St. Croix pharmacist, "P. E. Benzon" (= Peder Eggert Benzon; 1788–1848), during or before 1834, but Benzon is known to have collected plant material throughout the Danish West Indies. ZMUC-R 91–92, therefore, likely came from either St. Thomas or St. John, where *S. spilonotus* is known to occur. The holotype of *S. magnacruzae* **sp. nov.** was collected by a "Mr. Hartmann" on St. Croix, but we were unable to determine any additional information about him, other than the fact that the Hartmanns were prominent settlers and landholders in St. Croix in the 18th and 19th centuries.

Spondylurus martinae sp. nov.
Saint Martin Skink
(Figs. 55I, 70A, 71)

Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:36 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Breuil, 2002:273 (part).

Mabuya sloanii—Henderson & Powell, 2009:293 (part).

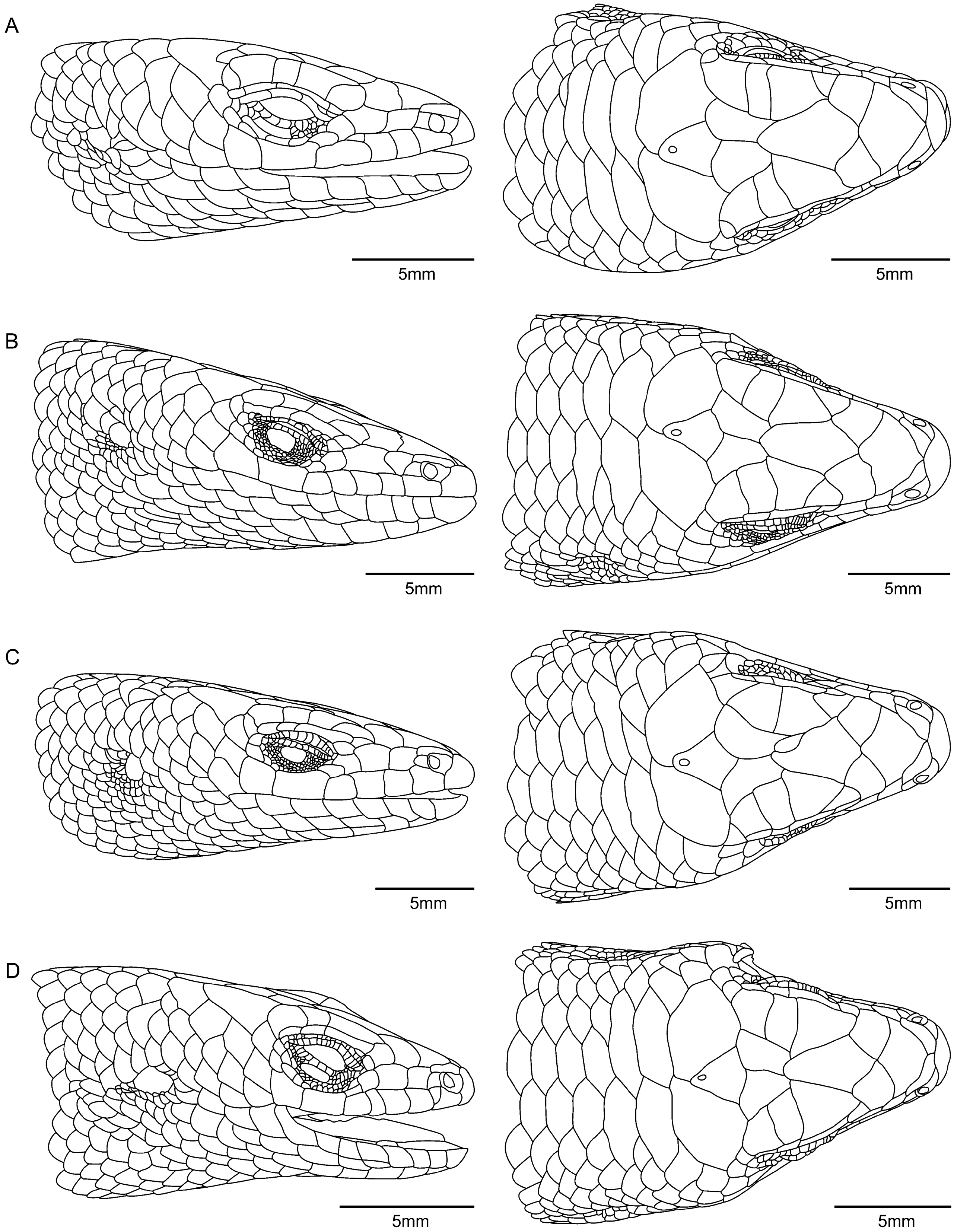

FIGURE 70. Head scalation in species of the Genus *Spondylurus* (left, side view; right, dorsal view). (A) *S. martinae* **sp. nov.** (ANSP 9514, paratype); (B) *S. monae* **sp. nov.** (UMMZ 73824, holotype); (C) *S. monitae* **sp. nov.** (USNM 576301, holotype); and (D) *S. nitidus* (MCZ R-6050, lectotype).

Holotype. MCZ R-86418, an adult female, collected in the vicinity of Little Bay, St. Martin, by G. A. Scamon (no other data). Date of accession, 1965.

Paratypes (n = 8). St. Martin. MCZ R-86419 (paratopotype), same collection data as holotype; ANSP 9503–07 and 9414–15, collected by H. E. Rijgersma, no specific locality, date unrecorded, but probably 1863–77 (see Remarks).

Diagnosis. *Spondylurus martinae* **sp. nov.** is characterized by (1) maximum SVL in males, not available; (2) maximum SVL in females, 83.1 mm; (3) snout width, 2.15–2.78% SVL; (4) head length, 15.0–17.1% SVL; (5) head width, 9.97–12.3% SVL; (6) ear length, 1.27–1.93% SVL; (7) toe-IV length, 8.22–10.5% SVL; (8) prefrontals, two; (9) supraoculars, three (78%), four (22%); (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, five (56%), six (44%); (13) nuchal rows, one (20%), two (40%), three (40%); (14) dorsals, 56–65; (15) ventrals, 68–71; (16) dorsals + ventrals, 124–133; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 13–17; (19) toe-IV lamellae, 15–19; (20) finger-IV + toe-IV lamellae, 28–36; (21) supranasal contact, Y (11%), N (89%); (22) prefrontal contact, Y (11%), N (89%); (23) supraocular-1/frontal contact, Y (67%), N (33%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. martinae* **sp. nov.** differs from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, and *S. semitaeniatus* by having a narrower dark dorsolateral stripe (1.86–2.09% SVL versus 2.12–4.64% SVL in those other species). It is separated from *S. fulgidus*, *S. lineolatus*, *S. macleani*, *S. nitidus*, *S. powelli* **sp. nov.**, and *S. turksae* **sp. nov.** by having a higher number of ventral scales (68–71 versus 55–67 in those other species). It is distinguished from *S. anegadae* **sp. nov.**, *S. monae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a wider middorsal stripe (2.76–4.01% SVL versus 0.953–2.62% SVL in those other species). It is distinguished from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (0.500–0.742 versus 0.276–0.464 in those other species). From *S. nitidus*, it differs by having a narrower head (head width 9.97–12.3% SVL versus 12.5–14.6% SVL in *S. nitidus*). From *S. fulgidus*, it differs by having a lower number of supraciliaries (four versus five in *S. fulgidus*). From *S. haitiae* **sp. nov.**, it differs by having a larger ear (ear length 1.27–1.93% SVL versus 1.19% in *S. haitiae* **sp. nov.**). It is separated from *S. lineolatus* by having a higher number of finger-IV lamellae (13–17 versus 8–11 in *S. lineolatus*). From *S. turksae* **sp. nov.**, it differs in having more midbody scale rows (32–34 versus 30). It is distinguished from *S. monitae* **sp. nov.** by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales in *S. monitae* **sp. nov.**).

Frequency differences also separate *Spondylurus martinae* **sp. nov.** from other species within the genus. From *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii*, it differs by having a lower frequency of supranasal contact (no contact in 89% of specimens versus supranasal contact in 80–100% of specimens belonging to those other species). It differs from *S. monae* **sp. nov.** and *S. nitidus* by having a shorter head (head length 15.0–17.1% SVL versus 17.3–20.7% in 83–86% of specimens belonging to those other species). It is distinguished from *S. caicosae* **sp. nov.** by having a higher number of ventral scales (68–71 versus 56–65 in 95% of specimens belonging to *S. caicosae* **sp. nov.**) and by having a higher number of midbody scale rows (32–34 versus 27–31 in 94% of specimens belonging to *S. caicosae* **sp. nov.**). From *S. powelli* **sp. nov.**, it differs by having a higher number of finger-IV + toe-IV lamellae (30–36 in 89% of specimens versus 25–29 in 94% of specimens belonging to *S. powelli* **sp. nov.**).

Description of holotype (Fig. 71). An adult female in good state of preservation, with injuries and with an abdominal slit. SVL 83.1 mm; tail length 50.1 mm (regenerated and broken); HL 12.8 mm; HW 10.2 mm; SW 1.79 mm; EL 1.60 mm; and toe-IV length 6.83 mm; ear-opening large in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal hexagonal, in contact with the first and second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular except right posterior loreal, which is squarish with a posteromedial projection. Two upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller (except the primary postocular, which is similar in size to temporal). One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and zero pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

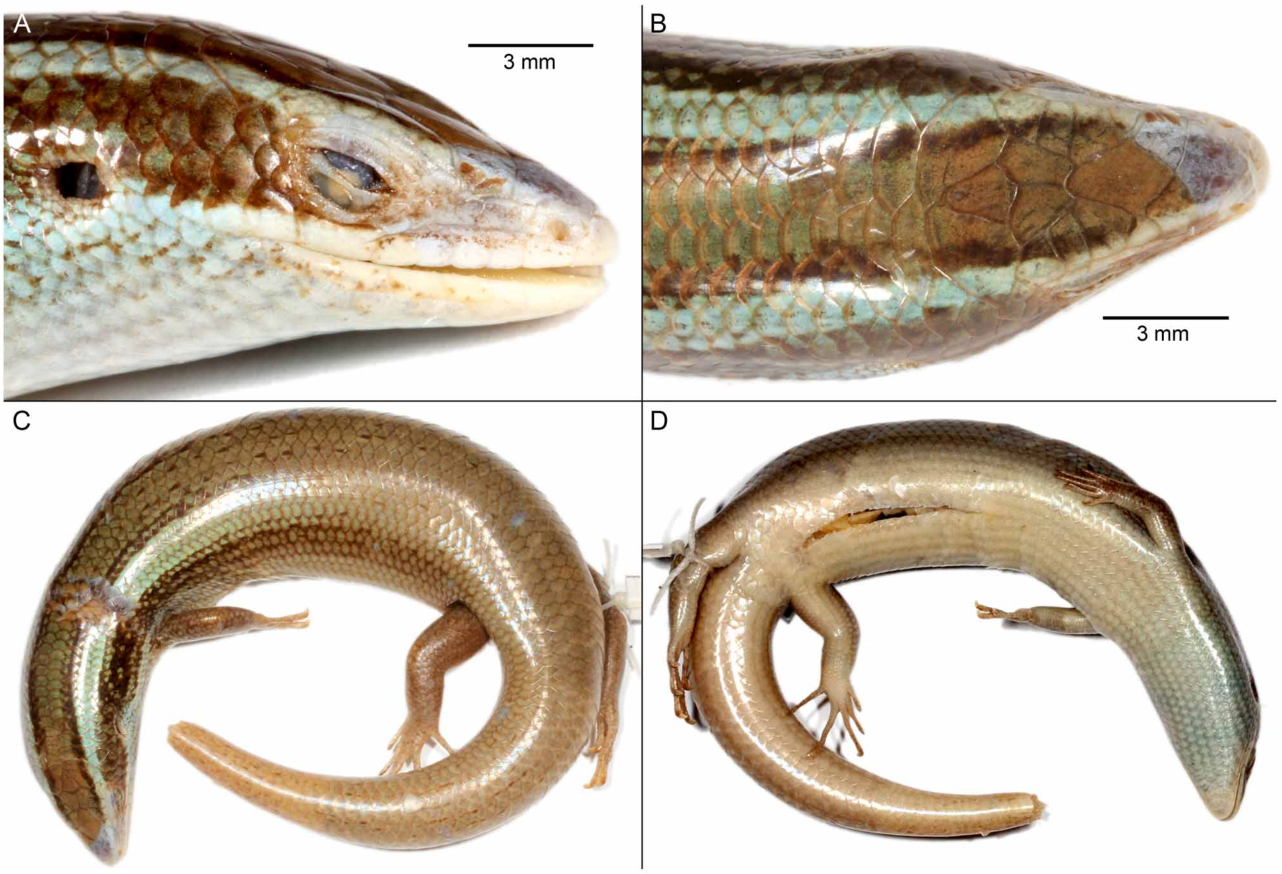

FIGURE 71. *Spondylurus martinae* **sp. nov.**, from St. Martin. (A–D) MCZ R-86418, holotype, Little Bay.

Body and limb scalation. One row of paired nuchal scales and one additional left nuchal. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 65 in a longitudinal row; ventrals similar to dorsals; 68 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. On regenerated portion of tail, one row each of enlarged middorsal and midventral scales with lateral rows on each side similar to dorsals and ventrals. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 15 under toe-IV. Six preanals similar to ventrals. Enlarged median subcaudal scales on regenerated portion of tail.

Pattern and coloration. Dorsal ground color medium brownish-green with small dark brown spots, distributed on body (mostly posterior to the forelimbs), tail, and limbs. Dark dorsolateral stripes present, narrow (1.70 mm), irregular, dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown with small pale spots, extending from loreal region to midbody and fading from midbody to hindlimbs. Pale middorsal stripe present, wide (2.29 mm), medium brownish-green (darker than dorsolateral stripes), extending from top of head to first third of body. Pale dorsolateral stripes present, whitish-green, extending from tip of snout to midbody. Pale lateral stripes present, whitish-green, extending from behind ear to forelimbs, bordered below (anterior of forelimbs) by a narrow, dark, broken line (row of spots). Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color in life in the holotype.

Variation. Most specimens resembled the holotype (Tables 3–5), except that the pattern on the older (ANSP) specimens had faded somewhat and could not be discerned on the heads (dorsal surface) of juveniles. Nonetheless, and typical of juveniles and fetuses of mabuyines, the body stripes on the juveniles appear bolder than on the adults. In this case, the dark lateral stripes extend to the hindlimbs.

Distribution. The species is distributed on St. Martin, where it is known only from Little Bay, although it is assumed to have been island-wide when extant (Fig. 11A).

Ecology and conservation. The date of collection of the MCZ holotype and paratype is not known, but they were accessioned in 1965. Aside from those specimens, the only other ones that we could locate were collected in 1863–1877, prior to the introduction of the mongoose in 1885–1889 (Horst *et al.* 2001). The 20th century specimens are promising, but recent authors have suggested that skinks have been extirpated from the island because they have not been seen or collected in decades (Breuil 2002; Powell 2006). Skinks are considered to be common on the nearby islands of the same bank, Anguilla (Hodge *et al.* 2003) and St. Barts (Breuil 2002). This is almost certainly because the mongoose is absent from those islands.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus martinae* **sp. nov.** to be Critically Endangered, and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on an island as large as St. Martin.

Reproduction. No data on reproduction are available for this species. However, the five juveniles (ANSP 9503–07), collected by Rijgersma, are all similar in size (39.2–41.5 mm SVL), suggesting that they share the same mother.

Etymology. The species name (*martinae*) is a feminine genitive singular noun referring to the distribution of the species on the island of St. Martin.

Remarks. No additional information is available on the holotype and MCZ paratype. The donor and probable collector of the ANSP paratypes, Hendrik E. van Rijgersma (1835–1877), was a Dutch naturalist and physician who practiced medicine on St. Martin during 1863–1877 (Holthius 1959). He collected plants and animals and sent the latter to the Academy of Natural Sciences, Philadelphia. They were received by E. D. Cope, who acknowledged the collection (Holthius 1959). No collection information is associated with those ANSP specimens, other than the island and the donor, and therefore the date of collection is constrained to Rijgersma's time on the island, 1863–1877. Dunn mentioned these ANSP specimens in the first sentence of his revision of "American Mabuyas" (Dunn 1936): "the following notes are an attempt to name Mabuyas from the islands of St. Martin, Redonda, and Marie Galante, in the collection of the Academy."

Dunn (1936) considered skinks from St. Martin, part of the Anguilla Bank in the northern Lesser Antilles, to be intermediate between his races of *Mabuya mabouya*. He did this because of the presence of dark dorsolateral stripes (a "*M. mabouya sloanii*" character) and a combination of characters from that race and "*M. m. mabouya*" (three and four supraoculars, one and multiple nuchal rows). However, supraoculars are frequently variable in species, and our counts of nuchals indicate a higher proportion of specimens of *S. martinae* **sp. nov.** with multiple rows of nuchals. Although no DNA data are available, the bold dorsolateral stripes (dark and pale) of *S. martinae* **sp. nov.** place that species in the Genus *Spondylurus*. The smaller maximum body size (83 mm SVL versus ~100 mm SVL in species of the Genus *Mabuya*) and presence of multiple nuchals in most specimens of *S. martinae* **sp. nov.** further support its placement in the Genus *Spondylurus*. Subsequent researchers have interpreted Dunn's (1936) remarks differently, leading to some confusion over what skinks actually occur in the northern Lesser Antilles and whether they are sympatric or not (see Remarks for the genus *Mabuya* for discussion).

***Spondylurus monae* sp. nov.**

Mona Skink
(Figs. 55J, 70B, 72)

Mabuia sloanii—Boulenger, 1896:113 (part).
Mabuia sloanii—Meerwarth, 1901:37 (part).
Mabuya sloanii—Stejneger, 1904:608 (part).
Mabuya sloanii—Barbour, 1914:320 (part).
Mabuya sloanii—Schmidt, 1926:156 (part).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya semitaeniatus—Grant, 1931:217 (part).
Mabuya semitaeniatus—Grant, 1932a:162 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya sloanii—Grant, 1937:504 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:27 (part).
Mabuya mabouya sloani—Rivero, 1978:71 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya mabouya sloani—Rivero, 1998:394 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. UMMZ 73824, from Mona Island, Puerto Rico, United States (no specific locality on Mona), collected in July 1931 by Chapman Grant.

Paratypes (n = 34). Mona Island, Puerto Rico (no specific locality unless indicated). CAS 10581–82, Harry A. Beatty, September 1944; CAS 14628, Chapman Grant (no additional collection information available); CM 23774–76, Harry A. Beatty, Sardinera, August 1944; MCZ R-36625–28, Chapman Grant, May–June 1931; RT 11933, beach woods behind Playa de Mujeres, 22–23 April 1994; UMMZ 73817–18 and 239529–32, Chapman Grant, May 1932; UMMZ 73825 and 239547, Chapman Grant, summer 1931; UMMZ 124819, Harold Heatwole, on road between lighthouse and landing pier, 5 November 1960; UMMZ 239533–46, Chapman Grant, July 1931.

Material not examined (n = 3). Mona Island, Puerto Rico. ZMH R09302–04, Mona Island (no specific locality), 16 May 1894, C. Bock.

Diagnosis. *Spondylurus monae* **sp. nov.** is characterized by (1) maximum SVL in males, 85.9 mm; (2) maximum SVL in females, 85.0 mm; unsexed holotype, 87.0 mm SVL; (3) snout width, 2.25–3.58% SVL; (4) head length, 16.1–20.0% SVL; (5) head width, 11.1–13.9% SVL; (6) ear length, 1.23–2.26% SVL; (7) toe-IV length, 8.09–10.4% SVL; (8) prefrontals, two; (9) supraoculars, three (3%), four (97%); (10) supraciliaries, three (3%), four (91%), five (6%); (11) frontoparietals, two; (12) supralabial below the eye, five (9%), six (91%); (13) nuchal rows, two (74%), three (26%); (14) dorsals, 56–65; (15) ventrals, 60–72; (16) dorsals + ventrals, 119–135; (17) midbody scale rows, 28–34; (18) finger-IV lamellae, 11–16; (19) toe-IV lamellae, 15–19; (20) finger-IV + toe-IV lamellae, 26–33; (21) supranasal contact, Y (60%), N (40%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (59%), N (41%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. monae* **sp. nov.** is distinguished from *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (0.985–2.14 versus 0.115–0.916 in those other species). It is distinguished from *S. culebrae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, *S. semitaeniatus*, *S. sloanii*, and *S. turksae* **sp. nov** by having a longer rostral scale (Fig. 61). It differs from *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, and *S. macleani*, by having dark lateral stripes nearly continuous to the hindlimbs (versus absent or only on anterior body in those other species). It is separated from *S. anegadae* **sp. nov.**, *S. macleani*, *S. powelli* **sp. nov.**, *S. sloanii*, and *S. turksae* **sp. nov.** by the presence of a distinct pale lateral stripe (versus no or faint pale lateral stripe in those other species). From *S. haitiae* **sp. nov.**, it differs by having a larger ear (ear length 1.23–2.26% SVL versus 1.19% in *S. haitiae* **sp. nov.**). It differs from *S. lineolatus* by having a longer head (head length 16.1–20.0% SVL versus 12.9–14.4% SVL in *S. lineolatus*) and by having two dark dorsolateral stripes and two dark lateral stripes (versus 10 dark equal-sized and equally-spaced narrow stripes in *S. lineolatus*). From *S. monitae* **sp. nov.**, it is distinguished by having parallel (versus concave) dark dorsolateral stripes on the parietal scales. From *S. anegadae* **sp. nov.**, it is larger (maximum SVL 87.0 mm versus 70.4 mm SVL).

Spondylurus monae **sp. nov.** also differs from other species in slightly overlapping characters. It is distinguished from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having a lower number of midbody scale rows (28–33 in 91% of specimens versus 34 in those other species). From *S. fulgidus*, it differs by having a lower number of supraciliaries (3–4 in 94% of specimens versus five in *S. fulgidus*). It is separated from *S. martinae* **sp. nov.** by having a longer head (head length 17.3–20.0% SVL in 83% of specimens versus 15.0–17.1% in *S. martinae* **sp. nov.**). It is separated from *S. nitidus* by having a shorter toe-IV (toe-IV length 8.09–10.0% SVL in 88% of specimens versus 10.1–12.7% SVL in 93% of specimens belonging to *S. nitidus).* In coloration, individuals from Mona (*S. monae* **sp. nov.**) have been described as being distinctly paler (in life) than those from Puerto Rico (= *S. nitidus*) and having white dorsolateral lines instead of iridescent bluish lines (Grant 1931; Rivero 1998). Also, *S. monae* **sp. nov.** tends to have triangular-shaped dark spots on the dorsum, whereas such spots are lacking in *S. nitidus*, as noted by Grant (1931).

Description of holotype (Figs. 70B, 72A–C). An adult (unsexed) in good state of preservation, without injuries and with an abdominal slit. SVL 87.0 mm; tail length 99.3 mm (regenerated); HL 14.2 mm; HW 10.4 mm; SW 2.60 mm; EL 1.77 mm; and toe-IV length 7.51 mm; ear-opening average in size and oval; toe length in the following order: I < II = V < III < IV.

FIGURE 72. *Spondylurus monae* **sp. nov.**, from Mona Island, Puerto Rico. (A–C) UMMZ 73824, holotype. (D) MCZ R-36627, paratype. Both from Mona Island (no specific locality).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, and frontal. Frontal heptagonal, lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal, lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posteromedial projection on latter. One upper preocular and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 61 in a longitudinal row; ventrals similar to dorsals; 70 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 16 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium tan with small dark brown spots, uniformly distributed on body. Forelimbs with dark brown mottling and hindlimbs mostly unpatterned. Dark dorsolateral stripes present, wide (2.06 mm), dark brown, extending from tip of snout to first third of body. Dark lateral stripes present, dark brown, extending from loreal region to last third of body. Pale middorsal stripe present, narrow (1.87 mm), medium tan, extending from tip of snout to first third of body. Pale dorsolateral stripes present, pale gray, extending from tip of snout to first third of body. Pale lateral stripes present, whitish, extending from below ear to first third of body, bordered below by a narrow dark line of spots. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color of the holotype in life.

Variation. In coloration and scalation, most specimens resembled the holotype (Tables 4–5). The pale dorsolateral stripes have been described as being cream in life (Rivero 1998).

Distribution. The species is distributed on Mona Island, 57 km^2 (Fig. 10B).

Ecology and conservation. The island is a roundish, raised limestone block, flat on top, and covered with mostly dry forest and cacti. It is designated as an ecological reserve by the government of Puerto Rico and has no permanent residents. It is maintained by Puerto Rico's Department of Natural Resources and managed on site by several park rangers.

Grant (1932a) made a general comment (for the Puerto Rico area) that the favorite hiding place of mabuyine skinks was in dense clumps of *Opuntia* cactus. Rivero (1998) noted that skinks on Mona are common in the Sardinera area where they can be seen "sunning on individual piles of coconut palm trash, apparently not more than one specimen per pile" (no date was given for this observation).

One current threat is from human disturbance. The island is being used by immigrants, especially Cubans (passing through Hispaniola), who use Mona and Monito as points of first contact on U.S. soil, in response to the U.S. government's Cuban Adjustment Act of 1966 and later revisions, now called the "wet feet/dry feet" policy. In 2010–2011, dozens of immigrants claimed Mona as home (primitive hotel) until they were rescued by the U.S. Coast Guard, as detailed in news reports. It is likely that some habitat has been disturbed, although this disturbance is probably more severe on Monito, which is much smaller and has far less habitat (see below). At the time of this writing, nothing is being done to prevent this from occurring, and it is not known how much disturbance is taking place or its effects on the biodiversity.

Although the mongoose is absent, the major threats to the skink are other introduced mammals, especially feral goats, pigs, cats, and rats. Browsing by feral goats has disrupted vegetation on Mona (Wiewandt & Garcia 2011), and feral cats can have a devastating effect on small lizards (Iverson 1978; García *et al.* 2001). Many of the threats to the survival of the endemic Mona Iguana, *Cyclura stejnegeri* (Wiewandt & Garcia 2011), apply to the Mona Skink. The last dated collection of *Spondylurus monae* **sp. nov.** was 51 years ago, but one of us (SBH) has seen a recent photograph of a live individual from Mona.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus monae* **sp. nov.** to be Endangered (EN A3c; B1ab(iii)+2ab(iii)). It faces a primary threat from predation by introduced mammals, including cats and black rats, and a secondary threat from habitat alteration (in part, as a result of destruction by feral mammals). Studies are needed to determine the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. Three females (71.4–82.3 mm SVL) contained 3 developing fetuses. The date of collection for those specimens was May 1932 and 22–23 April 1994.

Etymology. The species name (*monae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Mona.

Remarks. Boulenger (1896) appears to have made the first reference to mabuyine skinks occurring on Mona Island. See Remarks under *Spondylurus culebrae* **sp. nov.** for discussion of the confusion during the first half of the 20th century surrounding the name *S. semitaeniatus* and its application to skinks from Mona and Culebra.

Spondylurus monitae sp. nov.
Monito Skink
(Figs. 70C, 73A, 74)

Mabuya mabouya sloanii—Rolle *et al.*, 1964:322 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:27 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. USNM 576301, an adult female, collected on Isla Monito, Puerto Rico, United States, 12–13 February 1993, by Manuel Leal and Richard Thomas. Field tag USNMFS 192877.

Paratypes (n = 6). Isla Monito, Puerto Rico. RT 11377–79, 11427, Manuel Leal and Richard Thomas, 3–4 April 1993; RT 11391, Miguel Garcia, Manuel Leal, and Richard Thomas, 13–14 April 1993; and RT 11430, Richard Thomas, November 1993.

Diagnosis. *Spondylurus monitae* **sp. nov.** is characterized by (1) maximum SVL in males, 90.3 mm; (2) maximum SVL in females, 94.5 mm; (3) snout width, 2.42–3.16% SVL; (4) head length, 16.2–17.8% SVL; (5) head width, 11.5–13.8% SVL; (6) ear length, 1.35–1.59% SVL; (7) toe-IV length, 8.34–10.7% SVL; (8) prefrontals, two; (9) supraoculars, three (43%), four (57%); (10) supraciliaries, three (29%), four (43%), five (29%); (11) frontoparietals, two; (12) supralabial below the eye, five; (13) nuchal rows, two; (14) dorsals, 62–64; (15) ventrals, 64–69; (16) dorsals + ventrals, 126–132; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 12–15; (19) toe-IV lamellae, 16–17; (20) finger-IV + toe-IV lamellae, 29–32; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (86%), N (14%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. monitae* **sp. nov.** is separated from all other species by having concave (versus parallel) dark dorsolateral stripes on the parietal scales, forming a constriction on the top of the head (Fig. 73A). It differs from *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (0.874–1.27 versus 0.115–0.805 in those other species). It differs from *S. anegadae* **sp. nov.** and *S. semitaeniatus* by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.874–1.27 versus 1.35–3.79 in those other species). It differs from *S. lineolatus* and *S. turksae* **sp. nov.** by having more midbody scale rows (32–34 versus 26–30). From *S. anegadae* **sp. nov.**, it differs by lacking supranasal contact (versus contact in *S. anegadae* **sp. nov.**). It differs from *S. lineolatus* by having a longer head (head length 16.2–17.8% SVL versus 12.9–14.4% in *S. lineolatus*). It is distinguished from *S. macleani* by having lateral dark and pale stripes. From *S. monae* **sp. nov.**, it differs by having a higher rostral scale (Fig. 61). *Spondylurus monitae* **sp. nov.** further differs from *S. monae* **sp. nov.** in being larger: four of the six adult specimens are larger (88.5–94.5 mm SVL) than all of the 35 specimens of *S. monae* **sp. nov.** examined (87.0 mm SVL, maximum).

Spondylurus monitae **sp. nov.** also differs from other species in slightly overlapping characters. From *S. culebrae* **sp. nov.**, *S. magnacruzae* **sp. nov.**, *S. monae* **sp. nov.**, and *S. spilonotus*, it is distinguished by having fewer supralabials (supralabial five below the eye versus supralabial six or seven below the eye in 84–91% of specimens belonging to those other species). From *S. nitidus*, it differs by having a higher frequency of supraocular-1/frontal contact (contact in 86% of specimens versus no contact in 93% of specimens belonging to *S. nitidus*). It is separated from *S. semitaeniatus* and *S. sloanii* by lacking supranasal contact (versus contact in 95–96% of specimens belonging to those other species).

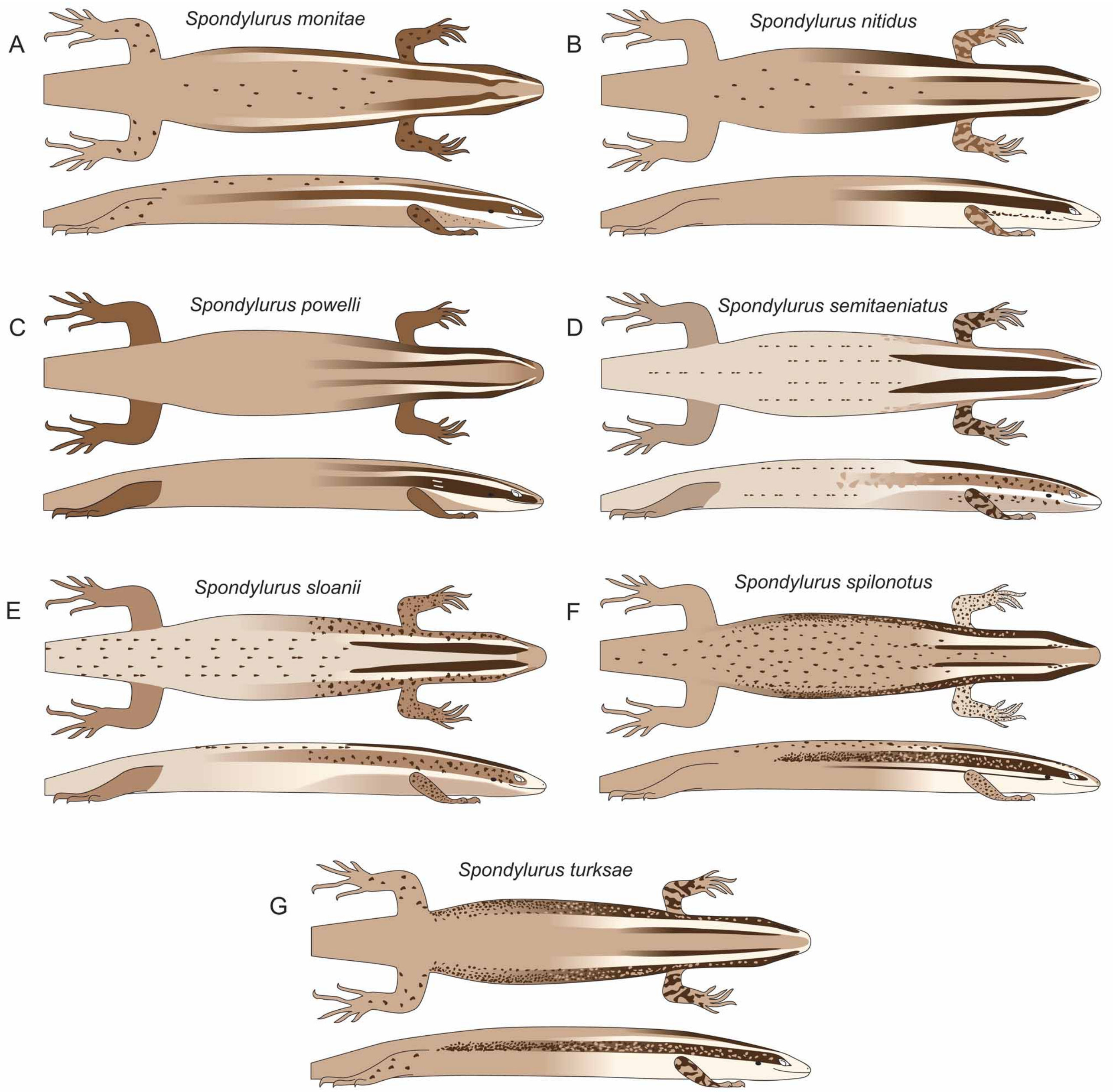

FIGURE 73. Representative patterns in species of the Genus *Spondylurus* (top, dorsal view; bottom, side view). (A) *S. monitae* **sp. nov.**; (B) *S. nitidus*; (C) *S. powelli* **sp. nov.**; (D) *S. semitaeniatus*; (E) *S. sloanii*; (F) *S. spilonotus*; and (G) *S. turksae* **sp. nov.**

Description of holotype (Figs. 70C, 74). An adult female in excellent state of preservation, without injuries and with an abdominal slit. SVL 89.3 mm; tail length not measured (complete); HL 15.3 mm; HW 11.3 mm; SW 2.45 mm; EL 1.34 mm; and toe-IV length 7.97 mm; ear-opening small and oval; toe length in the following order: I < V < II < III < IV.

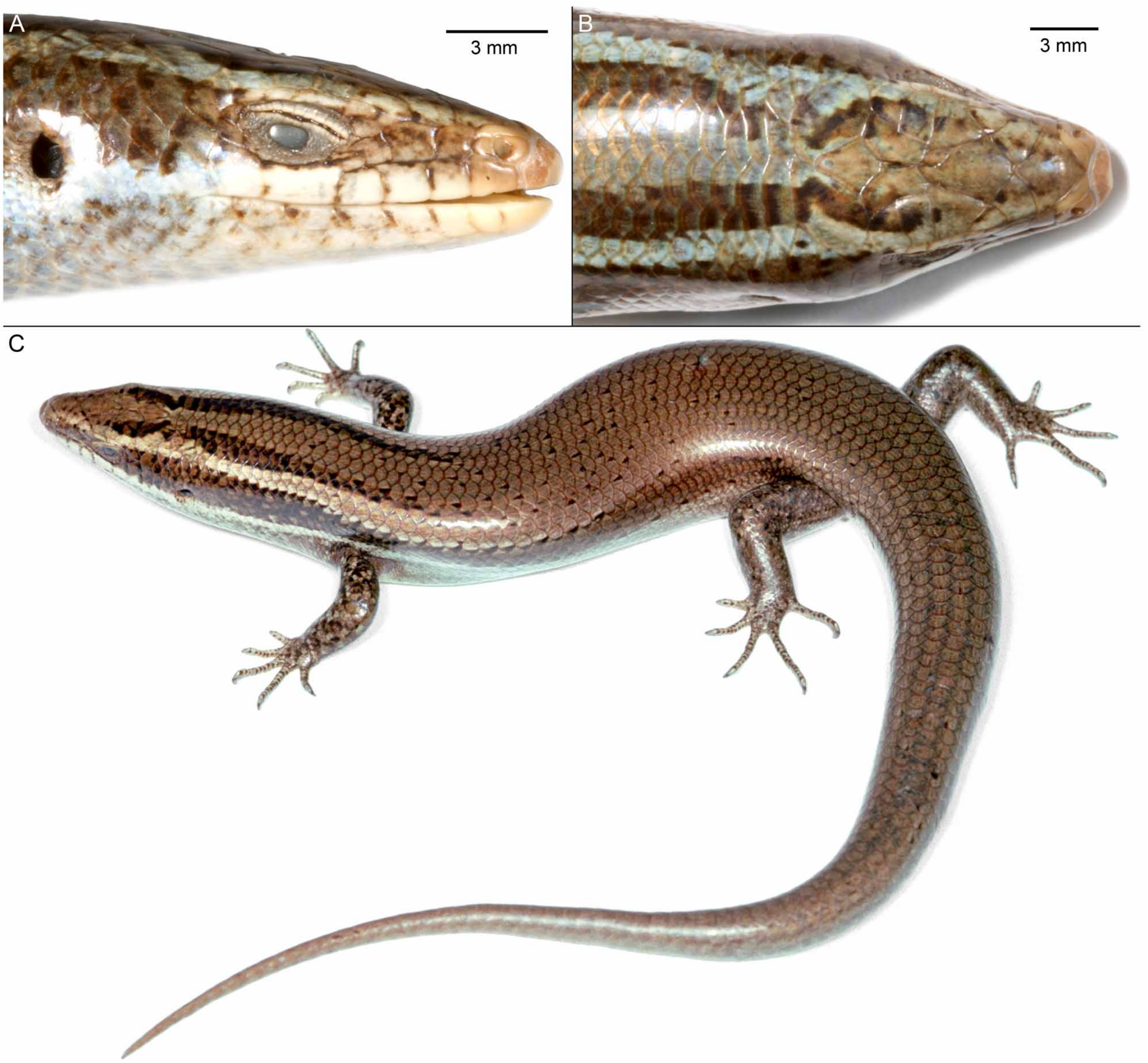

FIGURE 74. *Spondylurus monitae* **sp. nov.**, from Monito Island, Puerto Rico. (A–B) USNM 576301, holotype, Isla Monito (no specific locality). (C) USNM 576301, holotype (live individual, photographed by S. B. Hedges).

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraoculars, first supraciliary (right side only), and frontal. Frontal mostly tetragonal and shield-shaped, in contact with the first and second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior loreal squarish and posterior loreal rectangular with posterodorsal projection on latter. One upper preocular and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials with a small scale between infralabials six and seven on right. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 63 in a longitudinal row; ventrals similar to dorsals; 69 in a longitudinal row; 34 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 13 under finger-IV and 17 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium grayish-green with small dark brown spots uniformly distributed on body. Dark dorsolateral stripes present, narrow (2.19 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown, extending from loreal region to last third of body. Pale middorsal stripe present, wide (2.51 mm), grayish-green, extending from tip of snout to first third of body. Pale dorsolateral stripes present, whitish-blue, extending from loreal region to midbody. Pale lateral stripes present, whitish-blue, extending from loreal region to last third of body, not bordered below by a narrow dark line. Forelimbs pale blue and hindlimbs medium gray-green, all with small brown spots on dorsal surfaces and without pattern on ventral surfaces. Ventral surface of body without pattern except for small brown spots. Palmar and plantar surfaces unpigmented. No information is available on color of the holotype in life.

Variation. In coloration and scalation, the paratypes resembled the holotype (Tables 4–5).

Distribution. The species is distributed on Monito Island, 0.147 km^2 (Fig. 10B). The highest elevation on the island is 63 m.

Ecology and conservation. No ecological information is available for this species. Monito Island is a very small, uninhabited island located about 5 km NW of Mona Island. It is similar to Mona in being a raised limestone block and flat-topped, although vegetation is more limited in diversity. It has been described as xeric scrub vegetation consisting primarily of cacti, shrubs, and stunted trees growing from cracks in the limestone (Rolle *et al.* 1964). As with Mona, it is a Natural Reserve administered by the Puerto Rico Department of Natural Resources. The mongoose is not present on Monito. Black rats were present until the 1990s, at which time concern was expressed that they were responsible for declines in the endemic gecko population (*Sphaerodactylus micropithecus* Schwartz). An eradication program for the black rat was successful (Garcia *et al.* 2002).

One threat to the survival of *Spondylurus monitae* **sp. nov.** is from human disturbance, now at an all-time high. Monito Island is being used by immigrants, especially Cubans (passing through Hispaniola), who use it (and Mona Island) as a point of first contact on U.S. soil (see "Ecology and Conservation" for *S. monae* **sp. nov.**). In 2010–2011, dozens of immigrants claimed Monito as home until they were rescued by the U.S. Coast Guard. Typically, a dozen persons will stay on the small island at one time, often over one or more nights, until they are picked up by the Coast Guard. Presumably some habitat is disturbed, and perhaps campfires are built with some of the few trees on the island. This also raises the possibility that black rats could be brought to the island, unintentionally, on those boats carrying immigrants. A reintroduction of black rats could be devastating for the populations of endemic lizard species. At the time of this writing, nothing is being done to prevent these activities, and it is not known how much disturbance is taking place and its effects on the biodiversity.

Based on IUCN Redlist criteria (IUCN 2011), and because of this threat and small area of the island, we assess the conservation status of *Spondylurus monitae* **sp. nov.** to be Critically Endangered (CR A2ace). It, and *Sphaerodactylus micropithecus*, both face a primary threat from the potential introduction of invasive predators (black rats) as a result of unauthorized human activities on the island, and a major secondary threat from habitat alteration as a result of those same activities. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species, which has not been reported since 1993. Captive breeding programs should be considered, if the species still exists.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*monitae*) is a feminine genitive singular noun referring to the distribution of the species on the island of Monito (it is feminine despite the masculine diminutive Spanish island name).

Remarks. The first mention of a skink from Isla Monito was a sighting of a single specimen by Rolle *et al.* (1964). We have been unable to locate additional specimens of the species besides the seven examined here, all collected in 1993. It is remarkable that the small island of Monito supports an endemic species of skink (*Spondylurus monitae* **sp. nov.**), distinct from the species inhabiting the nearby island of Mona (*S. monae* **sp. nov.**). Besides non-overlapping scale and pattern differences, *S. monitae* **sp. nov.** is significantly larger than *S. monae* **sp. nov.** Based on morphology we suspect that the skinks from Mona and Monito may have been independently derived from Puerto Rico and are not closest relatives.

Spondylurus nitidus **(Garman 1887) comb. nov.**

Puerto Rican Skink

(Figs. 70D, 73B, 75)

Mabuya fulgida—Cope, 1868:311 (part).
Euprepes (Mabuia) spilonotus—Peters, 1876:708 (part).
Mabuia nitida—Garman, 1887:51. Lectotype: MCZ R-6050, San Juan, Puerto Rico, April 1879, Samuel Garman.
Mabuia sloanii—Boulenger, 1887:193 (part).
Mabuya sloanii—Stejneger, 1904:608 (part).
Mabuya sloanii—Barbour, 1914:320 (part).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Schmidt, 1928:121 (part; syntype from Hispaniola removed from type series of *Mabuia nitida*).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya sloanii—Grant, 1931:217 (part).
Mabuya sloanii—Grant, 1932a:162 (part).
Mabuya sloanii—Grant, 1932b:39 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:27 (part).
Mabuya mabouya sloani—Rivero, 1978:71 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya mabouya sloani—Rivero, 1998:394 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Material examined (n = 16). Puerto Rico. MCZ R-6050 (lectotype), Samuel Garman, San Juan, Puerto Rico, April 1879; MCZ R-176078–79 (paralectotypes), A. Stahl, San Juan, 5 February 1880; AMNH R-6462, R. W. Miner, Ensenada, June 1915; AMNH R-14007, B. A. Wall, Bayamón, 5 October 1919; CAS 54952, K. P. Schmidt, Ensenada, 22 September 1919; RT 4215, Richard Thomas, North Descalabrado, 4 February 1967; RT 8594, Jorge Moreno and Richard Thomas, Cerro del Muerto, 2 August 1980; UMMZ 73828, Chapman Grant, vicinity of Bayamón, 5 April 1931; UMMZ 73829, Chapman Grant, Cape San Juan, 2 August 1931; UPRRP 5401, Julio Garcia Díaz, Barrio Coto, Isabela, 11 June 1966. Cayo Luis Peña. UMMZ 73827, Chapman Grant, 20 April 1931. Cayo Norte. UPRRP 5055, Cayo Norte, 13 April 1965 (no collector information available). Culebra. UMMZ 239581, C. Grant, no specific locality, April 1932. Icacos. MCZ R-36624, Chapman Grant, 6 March 1932; UPRRP 2702, Frank Torres, 9 April 1963.

Diagnosis. *Spondylurus nitidus* is characterized by (1) maximum SVL in males, 87.1 mm; (2) maximum SVL in females, 95.5; (3) snout width, 2.38–3.57% SVL; (4) head length, 16.6–20.7% SVL; (5) head width, 12.5–14.6% SVL; (6) ear length, 1.32–2.36%; (7) toe-IV length, 9.45–12.7% SVL; (8) prefrontals, two; (9) supraoculars, three (7%), four (93%); (10) supraciliaries, four (93%), five (7%); (11) frontoparietals, two; (12) supralabial below the eye, five (27%), six (73%); (13) nuchal rows, one (7%), two (80%), three (13%); (14) dorsals, 55–63; (15) ventrals, 60–66; (16) dorsals + ventrals, 117–129; (17) midbody scale rows, 28–33; (18) finger-IV lamellae, 12–15; (19) toe-IV lamellae, 14–19; (20) finger-IV + toe-IV lamellae, 26–33; (21) supranasal contact, Y (53%), N (47%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (7%), N (93%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. nitidus* differs from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.292–0.619 versus 0.64–3.79 in those other species). It is distinguished from *S. haitiae* **sp. nov.**, *S. lineolatus*, and *S. martinae* **sp. nov.** by having a wider head (head width 12.5–14.6% SVL versus 9.58–12.3% SVL in those other species). From *S. haitiae* **sp. nov.**, *S. lineolatus*, and *S. turksae* **sp. nov.**, it is distinguished by having a longer head (head length 16.6–20.7% SVL versus 12.9–16.5% SVL in those other species). From *S. lineolatus* and *S. turksae* **sp. nov.**, it is distinguished by having a longer toe-IV (toe-IV length 9.45–12.7% SVL versus 7.23–9.16% SVL in those other species). It differs from *S. magnacruzae* **sp. nov.** and *S. spilonotus* by having a lower number of midbody scale rows (28–33 versus 34 in those other species). From *S. caicosae* **sp. nov.**, it is distinguished by having dark lateral stripes continuous to the hindlimbs (versus dark lateral stripes that are discontinuous or absent at the hindlimbs in *S. caicosae* **sp. nov.**). It is separated from *S. haitiae* **sp. nov.** by having a larger ear (ear length 1.32–2.36% SVL versus 1.19% in *S. haitiae* **sp. nov.**). It differs from *S. macleani* by having a darker middorsal stripe (versus middorsal stripe similar in color to pale dorsolateral stripes in *S. macleani*). It is distinguished from *S. martinae* **sp. nov.** by having a lower number of ventrals (60–66 versus 68–71 in *S. martinae* **sp. nov.**). It is separated from *S. monitae* **sp. nov.** by having parallel dark dorsolateral stripes on the parietal scales, versus concave stripes that form a constriction on the top of the head in *S. monitae* **sp. nov.** (Fig. 73).

Spondylurus nitidus also differs from other species in slightly overlapping characters. It differs from *S. monae* **sp. nov.** by having a longer toe (toe-IV length 10.1–12.7% SVL versus 8.09–10.0% SVL in 86% of specimens of *S. monae* **sp. nov.**). From *S. caicosae* **sp. nov.**, it differs by having a higher number of finger-IV lamellae (13–15 in 80% of specimens versus 9–12 in 89% of specimens belonging to *S. caicosae* **sp. nov.**). From *S. fulgidus*, it is separated by having a lower number of supraciliaries (four in 93% of specimens versus five in *S. fulgidus*) and by having a higher number of dorsals (57–63 in 80% of *S. nitidus* versus 52–56 in 88% of *S. fulgidus*). It is distinguished from *S. monitae* **sp. nov.** by having a lower frequency of supraocular-1/frontal contact (no contact in 93% of specimens versus contact in 86% of specimens belonging to *S. monitae* **sp. nov.**). It differs from *S. powelli* **sp. nov.** by having a lower number of dorsals (55–61 in 93% of specimens versus 62–65 in 87% of specimens belonging to *S. powelli* **sp. nov.**) and by having a higher number of finger-IV + toe-IV lamellae (29–33 in 80% of specimens versus 25–28 in 81% of specimens belonging to *S. powelli* **sp. nov.**). Additionally, *S. nitidus* is a larger species than *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. macleani*, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. powelli* **sp. nov.**, *S. semitaeniatus*, *S. sloanii*, and *S. turksae* **sp. nov.** (maximum adult SVL 95.5 mm versus 63.7–94.5 in those other species). In coloration, individuals from Puerto Rico (= *S. nitidus*) have been described as being "considerably darker" than those from Mona (= *S. monae* **sp. nov.**) (Rivero 1998).

Description of lectotype (Figs. 70D, 75A–C). An adult female in moderate state of preservation, without injuries and with an abdominal slit. SVL 84.5 mm; tail complete (length not measured); HL 15.3 mm; HW 11.2 mm; SW 2.87 mm; EL 1.89 mm; and toe-IV length 9.32 mm; ear-opening large in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal hexagonal, semi-diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, barely separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars, and frontal. Frontal tetragonal, lanceolate, in contact with the first supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal triangular, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Three supraoculars, the first one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter on the right; anterior and posterior loreals rectangular with posterodorsal projection on latter on the left. Two upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Three moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin curved slightly toward tip of snout. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First and second pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

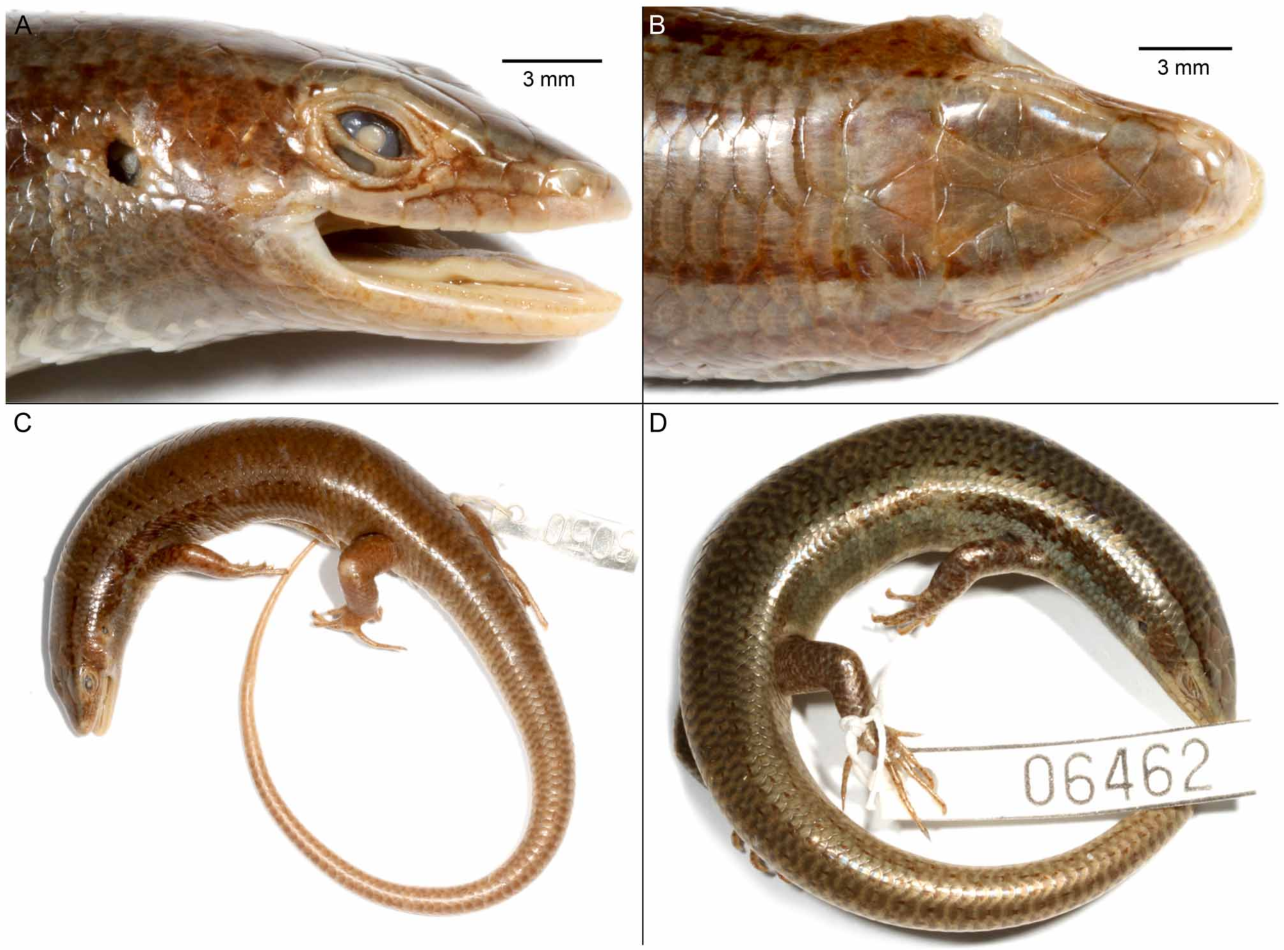

FIGURE 75. *Spondylurus nitidus*, from Puerto Rico. (A–C) MCZ R-6050, lectotype, San Juan. (D) AMNH R-6462, Ensenada.

Body and limb scalation. Two rows of nuchal scales, both paired. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 55 in a longitudinal row; ventrals similar to dorsals; 63 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 15 under toe-IV. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brown with small dark brown spots, distributed on body, tail, and limbs. Forelimbs with dark brown mottling. Dark dorsolateral stripes present, narrow (1.52 mm), dark brown, extending from top of head to just behind ears. Dark lateral stripes present, dark brown, extending from loreal region to last third of body. Pale middorsal stripe present, wide (4.35 mm), medium brown, extending from tip of snout to about half the distance between ears and forelimbs. Pale dorsolateral stripes present, light brownish-gray, extending from tip of snout to first third of body. Pale lateral stripes present, pale gray, extending from behind eye to last third of body, not bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color of the holotype in life.

Variation. In coloration, the pale dorsolateral stripes of *S. nitidus* have been described as "iridescent bluish" (Grant 1931). However, bluish lines were not seen in a live *S. nitidus* described later (Rivero 1998). Because Grant (1931) did not specifically say that his specimens of *S. nitidus* were alive, it is likely they were preserved. The pale (whitish) areas in mabuyines often become greenish-blue in preservative. A narrow, dark ventrolateral stripe (or line of spots), as shown in Fig. 73B, is present in some individuals but not the holotype. Variation is presented in Tables 3–5.

Distribution. The species is distributed on Puerto Rico and its satellites of Cayo Luis Peña, Cayo Norte, Culebra, Desecheo (literature record), Icacos, and Vieques (literature record; see Remarks) (Fig. 10A, C–D).

Ecology and conservation. Grant (1932a) made a general comment (for the Puerto Rico area, which includes multiple species) that the favorite hiding place of mabuyine skinks was in dense clumps of *Opuntia* cactus. Rivero (1998) also made a general comment, perhaps applying to multiple species (as recognized here) that skinks seem "to be more partial to arid and semi-arid regions" and that most specimens have been collected at the base of coconut palms, under rocks or in rock fissures, or under clumps of cacti (*Opuntia*). Other collecting locations noted included a knot hole in a fence post, trees 1–3 m above ground, on the leaf of a terrestrial bromeliad (*Bromelia pinguin*), and inside a house. Rivero also mentions that this species, on Desecheo, emerges from retreats preferentially during cloudy days.

Even as early as 1904, Stejneger remarked about the rarity of skinks in Puerto Rico, noting "its present scarcity is probably due to the mongoose." Later, Rivero (1978) noted, "The chances of seeing this species in Puerto Rico proper are quite remote.." Intensive general herpetological survey efforts by resident herpetologists in the last half-century have yielded only a few specimens, which were examined here. Further evidence of the scarcity of this species is that a relatively small number of specimens could be located in museum collections (from all years), with the most recent being collected in 1980. There have been more recent observations, but confirmation (e.g., photographic) that this species still exists is needed, especially because it could be confused, in the field with both native (e.g., *Diploglossus pleii*) and introduced (e.g., *Gymnophthalmus underwoodi*, *Scincella lateralis*) species of lizards (see Remarks).

The mongoose is throughout Puerto Rico and is likely the primary reason for the rarity of this species, as surmised by Stejneger (1904), although black rats are in all habitats and elevations. These and other introduced predators do not recognize the boundaries of the so-called "protected areas" in Puerto Rico (e.g., wildlife refuges and national parks), and therefore the skinks are not actually protected.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus nitidus* to be Critically Endangered (CR A2ae). It faces a primary threat from the introduced mongoose, which has greatly reduced its numbers. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists, because eradication of introduced mammalian predators is not possible on the main island of Puerto Rico because of its size. Also, genetic studies are needed to confirm the taxonomic status of populations of *Spondylurus* on the satellite islands of Puerto Rico, here assigned to *S. nitidus*.

Reproduction. One female (95.5 mm SVL) contained two developing young. The date of collection for that specimen was 5 April 1931.

Etymology. Not provided in the original description. However, the species name (*nitidus*), a Latin feminine singular adjective meaning "shining" or "polished," apparently refers to the coloration, described by Garman (1887) as "bronzed."

Remarks. The earliest reference to mabuyine skinks on the main island of Puerto Rico appears to have been by Cope (1862a). Skinks were recorded by Riise from Vieques (Reinhardt & Lütken 1863), but no specimens are known to exist. It has never been seen there since then, probably because of the presence of the mongoose, and Grant (1932b) remarked that "*Mabuya* was not seen or known to the natives" of Vieques when he visited in 1931. It may have been one of several nearby species—*S. nitidus*, *S. culebrae* **sp. nov.**, *S. sloanii*—or an undescribed species. In the first edition of his book on the amphibians and reptiles of Puerto Rico, Rivero (1978) did not list skinks as occurring on Vieques, but he added that island in his second edition (Rivero 1998), noting that they were "relatively common" there. We believe that to be an error because there are no museum records, and herpetologists who have visited the island in recent decades have not seen it. More out of convenience, we note this old literature record (Reinhardt & Lütken 1863) here, under *S. nitidus*, but suspect that it was an endemic species that probably occurred only on the island of Vieques and was wiped out by the mongoose before a specimen made it to a museum.

Two specimens of skinks collected in southwestern Puerto Rico (CAS 175490–491), on the west side of Bahía de Ballena, are not mabuyines but rather appear to be a species from the southeastern United States, *Scincella lateralis*. Apparently there was no mix-up of museum numbers because the collector recalls collecting those specimens (A. Bauer, personal communication). They are 39–40 mm (SVL) and have four supraoculars, seven supraciliaries, paired frontoparietals, frontonasal-frontal contact, 2–3 rows of nuchals, 60–63 dorsals, 61–72 ventrals, 26 midbody scale rows, and 14 toe-IV lamellae. In pattern they are typical of *Scincella lateralis*, although their dorsal counts are a bit lower than reported in the literature (Smith 1946). Considering that nearly all of the West Indian herpetofauna is derived from South America (Hedges 1996b), we consider it unlikely that *Scincella* is native to Puerto Rico, especially since that locality has been visited by many herpetologists during the last century without turning up other specimens. The best explanation is that they were introduced, probably as released pets, at a popular beach on the island.

***Spondylurus powelli* sp. nov.**
Anguilla Bank Skink
(Figs. 73C, 76A, 77)

Mabuya mabouya mabouya—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya mabouya—MacLean *et al.*, 1977:36 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1988:150 (part).
Mabuya mabouya mabouya—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya mabouya—Breuil, 2002:267 (part).
Mabuya sp. Hodge *et al.*, 2003:43.
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. MCZ R-74343, an adult male, collected 29 May 1963 in Shannon Hill (North of Sandy Ground), Anguilla, by James D. Lazell.

Paratypes (n = 15). Anguilla. BWMC 06754–55, Robert Powell and Avila REU, Junk's Hole, 17 June 2000; CM 115518 and CM 115480, Ellen J. Censky, Brimegin, 1987; CM 115481, Ellen J. Censky, no specific locality, 1987; MPM 23178, R. A. Sajdak, North Hill, 1987; RT 8335–37, Ava Gaa and Richard Thomas, Shoal Bay, January 1980. St. Barts. KU 242090–92, Albert Schwartz, Baie de St. John (no collection dates available); MNHN 1997.6064, M. Breuil, no specific locality, 1997; MNHN 2003.0844, M. Magras, no specific locality, 2003; MPM 23055, 0.5 km E L'Orient Beach (no collection date available).

Diagnosis. *Spondylurus powelli* **sp. nov.** is characterized by (1) maximum SVL in males, 71.7 mm; (2) maximum SVL in females, 69.8 mm; (3) snout width, 2.28–3.02% SVL; (4) head length, 15.6–18.4% SVL; (5) head width, 11.7–14.4% SVL; (6) ear length, 1.36–2.64% SVL; (7) toe-IV length, 8.45–11.5% SVL; (8) prefrontals, two; (9) supraoculars, two (6%), three (13%), four (81%); (10) supraciliaries, three (6%), four (94%); (11) frontoparietals, two; (12) supralabial below the eye, five (31%), six (69%); (13) nuchal rows, one (19%), two (63%), three (19%); (14) dorsals, 59–65; (15) ventrals, 62–67; (16) dorsals + ventrals, 121–132; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 11–14; (19) toe-IV lamellae, 14–18; (20) finger-IV + toe-IV lamellae, 25–32; (21) supranasal contact, Y (19%), N (81%); (22) prefrontal contact, Y (25%), N (75%); (23) supraocular-1/frontal contact, Y (38%), N (63%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, N (or barely evident on side of neck); and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. powelli* **sp. nov.** is separated from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.232–0.762 versus 0.874–3.79 in those other species). It differs from *S. caicosae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, *S. semitaeniatus*, and *S. spilonotus* by lacking a pale lateral stripe. It is separated from *S. haitiae* **sp. nov.** by having a larger ear (2.28–3.02% SVL versus 1.19% SVL in *S. haitiae* **sp. nov.**) and by having fewer ventrals (62–67 versus 69–72 in *S. haitiae* **sp. nov.**). It differs from *S. fulgidus* by having fewer supraciliaries (3–4 versus five in *S. fulgidus*) and more dorsals + ventrals (121–132 versus 108–120). It is distinguished from *S. lineolatus* by having a larger head (head length 15.6–18.4% SVL versus 12.9–14.4% SVL in *S. lineolatus*), a higher number of midbody scale rows (32–34 versus 26–28 in *S. lineolatus*), and four dark stripes instead of 10. From *S. macleani*, it is distinguished by having a darker middorsal stripe (zone) versus middorsal stripe similar to pale dorsolateral stripes in *S. macleani*. It is separated from *S. martinae* **sp. nov.** by having fewer ventrals (62–67 versus 68–71 in *S. martinae* **sp. nov.**). It differs from *S. turksae* **sp. nov.** by having a higher number of midbody scale rows (32–34 versus 30).

In terms of slightly overlapping (frequency) traits, *Spondylurus powelli* **sp. nov.** differs from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower frequency of supranasal contact (no contact in 81% of specimens versus contact in 80–100% of specimens belonging to those other species). From *S. martinae* **sp. nov.** and *S. nitidus*, it differs by having fewer finger-IV + toe-IV lamellae (25–28 in 81% of specimens versus 29–36 in 80–89% of specimens belonging to those other species). It differs from *S. caicosae* **sp. nov.** by having a higher number of midbody scale rows (32–34 versus 27–31 in 94% of specimens belonging to *S. caicosae* **sp. nov.**) and by having a higher number of dorsal + ventral scales (125–132 in 93% of specimens versus 113–124 in 85% of specimens belonging to *S. caicosae* **sp. nov.**).

Description of holotype (Figs. 76A, 77A–B). An adult male in excellent state of preservation, without injuries and without an abdominal slit. SVL 69.5 mm; tail length not measured; HL 12.1 mm; HW 10.0 mm; SW 2.06 mm; EL 1.55 mm; and toe-IV length 7.31 mm; ear-opening average in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal heptagonal, near-diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, in contact medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first supraoculars and frontal. Frontal tetragonal and lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal acorn- or shield-shaped, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals rectangular with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. Three rows of nuchal scales, all paired except the last. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 59 in a longitudinal row; ventrals similar to dorsals; 62 in a longitudinal row; 32 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 12 under finger-IV and 14 under toe-IV. Four preanals larger than adjacent ventral scales. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium grayish-green with small dark brown flecks, sparsely distributed on body, tail, and limbs. Limbs darker than body. Dark dorsolateral stripes present, narrow (1.49 mm), dark brown, extending from tip of snout to first third of body. Dark lateral stripes present, dark brown with pale spots, extending from loreal region to first third of body. Pale middorsal stripe present, wide (2.73 mm), grayish-green, extending from tip of snout to first third of body. Pale dorsolateral stripes present, pale gray, extending from tip of snout to first third of body. Pale lateral stripes barely evident, whitish, extending from below ear to forelimbs, bordered below by irregular brown spots. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color of the holotype in life.

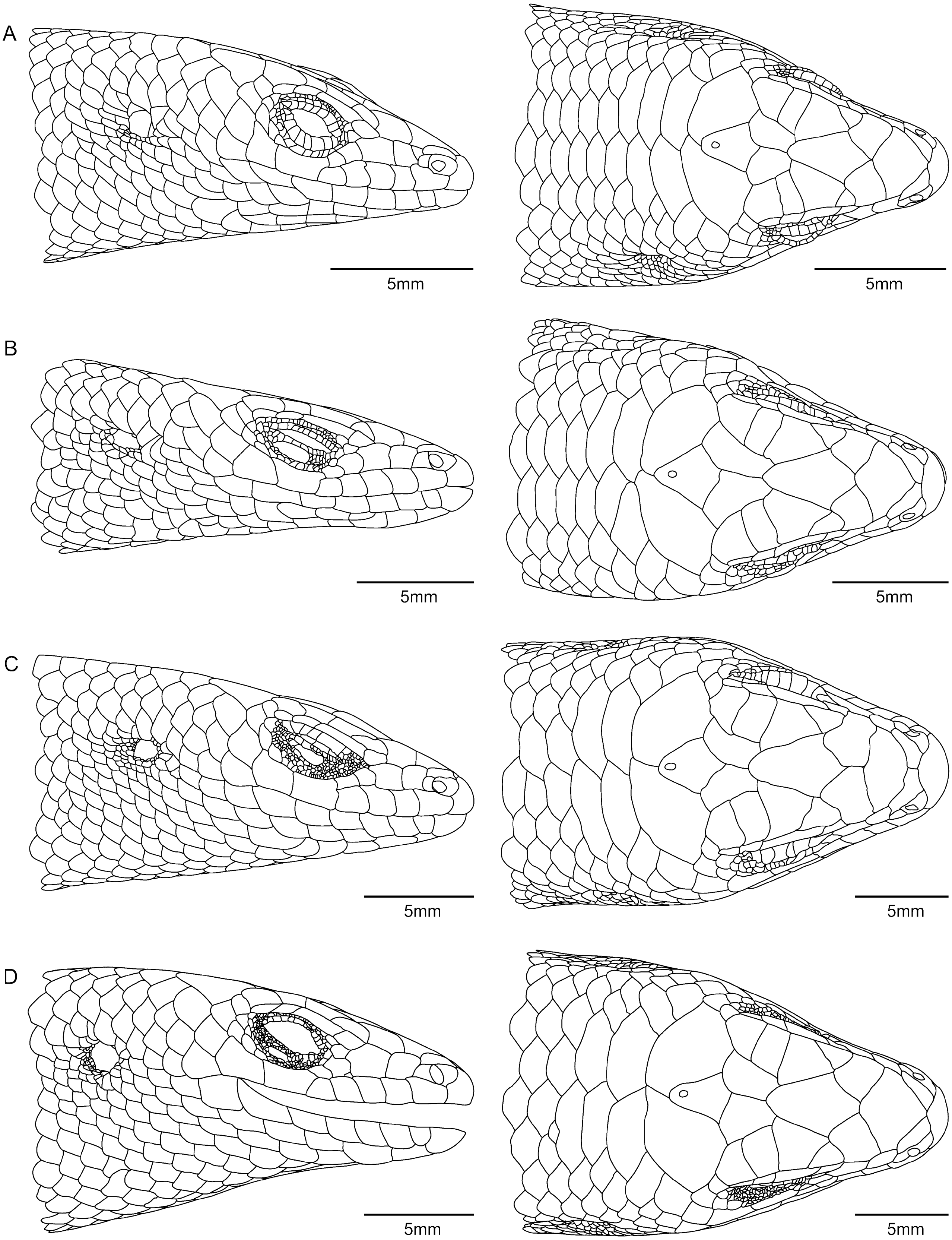

FIGURE 76. Head scalation in species of the Genus *Spondylurus* (left, side view; right, dorsal view). (A) *S. powelli* **sp. nov.** (MCZ R-74343, holotype); (B) *S. semitaeniatus* (UMMZ 80585); (C) *S. sloanii* (USNM 576305); and (D) *S. spilonotus* (ZMUC-R 94).

Variation. In coloration and scalation, other specimens resembled the holotype, although pale lateral stripe weak or absent in most (Tables 4–5). Juveniles of this species, at least on St. Barts but presumably on Anguilla as well, have blue tails in life (Fig. 77G). No adult has been observed with a blue tail on either island, suggesting that the blue tail coloration is lost in adults. Other mabuyine species with blue tails, of which we are aware, are *Panopa carvalhoi*, *P. croizati*, and *Spondylurus lineolatus*.

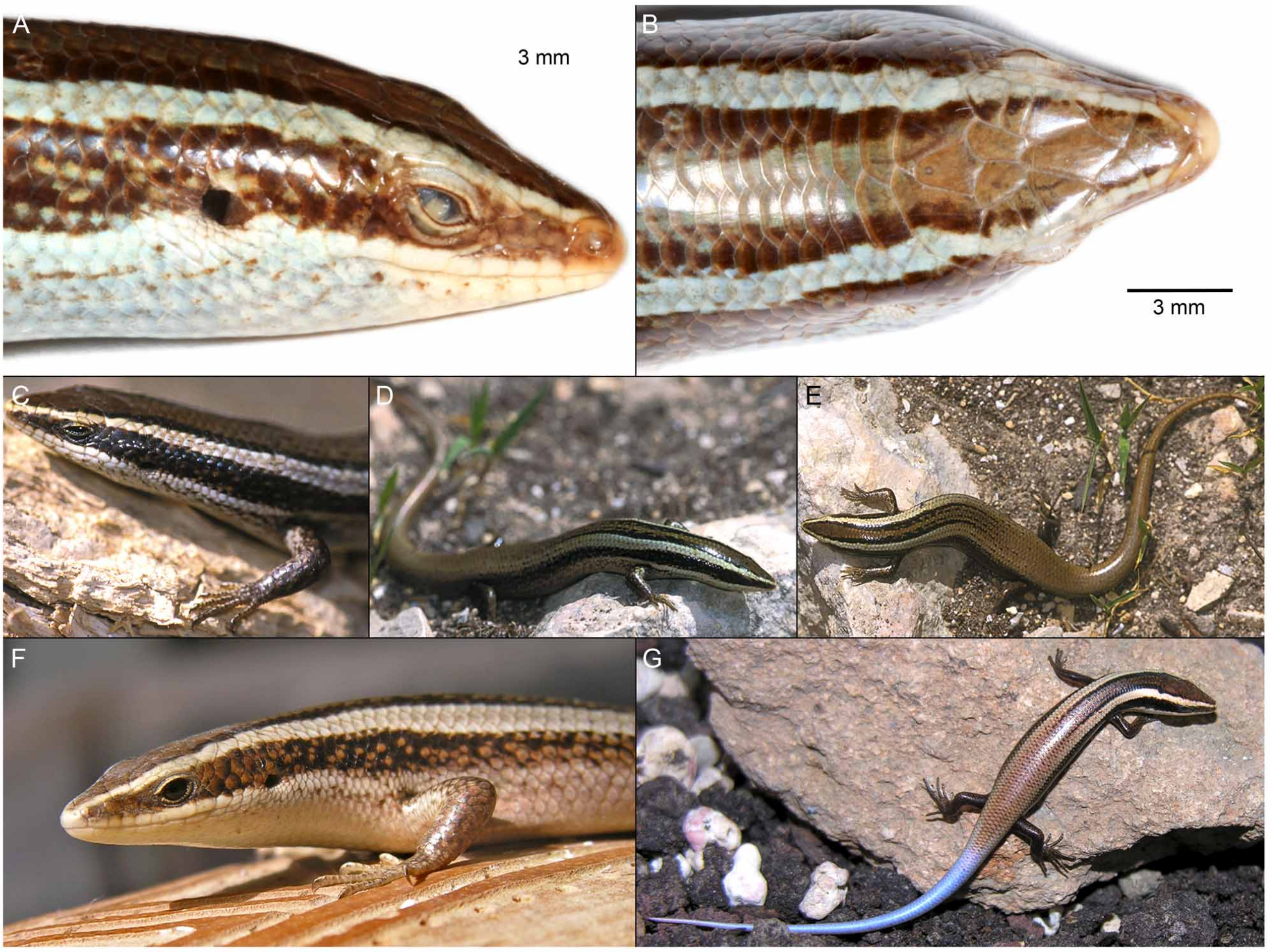

FIGURE 77. *Spondylurus powelli* **sp. nov.**, from Anguilla and Barthélemy. (A–B) MCZ R-74343, holotype, Shannon Hill, Anguilla. (C–E) uncataloged, Anguilla (live individuals, photographed by Robert Powell). (F–G) uncataloged, St. Barthélemy (live individuals, photographed by Karl Questal).

Distribution. The species is distributed on Anguilla (91 km^2), including Dog Island (literature record), and Saint-Barthélemy (also called St. Barts, 21 km^2). All are part of the Anguilla Bank in the northern Lesser Antilles (Fig. 11A). However it is absent from St. Martin, which is also on that bank and is inhabited by another species, *Spondylurus martinae* **sp. nov.**

Ecology and conservation. Skinks are considered to be common on Anguilla (Hodge *et al*. 2003) and St. Barts (Breuil 2002), undoubtedly because the mongoose is absent. In that sense these islands share with Dominica (*Mabuya dominicana*) and a few other islands the striking contrast between islands lacking the mongoose—and having seemingly healthy populations of skinks—and those where skinks have been severely decimated by the introduction of the mongoose, such as nearby St. Martin. On Anguilla skinks have been found on and in loosely constructed rock walls (Hodge *et al*. 2003). On St. Barts skinks have been found in sunny situations on cacti and in tall grass, and sometimes in houses (Breuil 2002). Anguilla and St. Barts are not large islands, and threats to the survival of *Spondylurus powelli* **sp. nov.** are numerous. Invasive species, including competitors and predators, are spreading on Caribbean islands and could severely impact this species. Habitats are being altered on the islands (e.g., removal of vegetation, use of pesticides), mostly for urbanization and tourism (Hodge *et al*. 2003). Also, fear of snakes by locals on these islands has led to the killing of not only the native snakes but also the skinks, which are sometimes mistaken for snakes (Breuil 2002; Hodge *et al.* 2003).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus powelli* **sp. nov.** as Vulnerable (VU A2ce). It faces a primary threat from predation by introduced mammals, including black rats, and a secondary threat from habitat alteration as a result of urbanization and tourism. Studies are needed to determine the health of any remaining populations, and threats to the survival of the species.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*powelli*) is in honor of Robert Powell for his contributions to West Indian herpetology.

Remarks. DNA sequences of specimens from Anguilla and St. Barts are virtually identical (Figs. 5–6). Also, morphologically, there is no detectable difference between the Anguilla and St. Barts populations. This was surprising given that the two islands are separated by 25 km and by the large island of St. Martin, which has a separate, endemic species (*Spondylurus martinae* **sp. nov.**). Any vicariance from the isolation of previously connected land areas of the Anguilla bank, during the Pleistocene and Holocene, would be expected to be reflected in at least some genetic divergence at this relatively fast evolving gene (Cytochrome b). If this low sequence divergence was caused by natural dispersal on flotsam—based on currents, only from St. Barts to Anguilla—that dispersal event must have occurred very recently. Movement between the two islands by humans is a more likely explanation for this low sequence divergence, instead of recent, natural dispersal. Yet another explanation, that they are both recent colonists from another location, is unlikely because there is no other island known with this species. Phylogeographic studies using microsatellites or other fast-evolving markers might be able to resolve which of the two island populations, Anguilla or St. Barts, or both, is native and which (if either) is introduced.

***Spondylurus semitaeniatus* (Wiegmann 1837) comb. nov.**

Lesser Virgin Islands Skink
(Figs. 73D, 76B, 78)

Euprepes semitaeniatus—Wiegmann, 1837:135. Holotype from "America," ex. coll. Marcus Elieser Bloch (see Remarks).

Gongylus (*Eumeces*) *agilis*—Reinhardt & Luetken, 1863:229 (part).

Euprepes semitaeniatus—Peters, 1864:50 (holotype clarified as ZMB 1238, same specimen as examined by Schneider [1801:181], for syntype of *Scincus auratus*; originally from collection of Bloch).

E[uprepes] semitaeniatus—Peters, 1871:400 (part, inferred).

Mabuya sloanii—Bocourt, 1879:401 (part).

Mabuia sloanii—Boulenger, 1887:193 (part, inferred).

Mabuya semitaeniata—Stejneger, 1904:610 (claimed as distinct species, but listed incorrect accession number for holotype).

Mabuya sloanii—Barbour, 1914:320 (part).

Mabuya sloanii—Schmidt, 1928:121 (part).

Mabuya sloanii—Barbour, 1930:105 (part).

Mabuya semitaeniatus—Grant, 1931:218 (Culebra and Mona, in error; listed incorrect accession number for holotype).

Mabuya mabouia—Barbour, 1935:129 (part).

Mabuya mabouya sloanii—Dunn, 1936:544 (part; placed *Euprepes semitaeniatus* in synonymy but listed incorrect accession number for holotype).

Mabuya mabouia—Barbour, 1937:147 (part).

Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part; placed *Euprepes semitaeniatus* in synonymy but listed incorrect accession number for holotype).

Mabuya mabouya sloanei—MacLean *et al.*, 1977:30–35 (part).

Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).

Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part; placed *Euprepes semitaeniatus* in synonymy but listed incorrect accession number for holotype).

Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).

Mabuya bistriata—Powell *et al.*, 1996:82 (part).

Mabuya sloanii—Mayer & Lazell, 2000:883 (part).

Mabuya sloanii—Miralles, 2005:49 (part).

Mabuya sloanii—Henderson & Powell, 2009:293 (part).

FIGURE 78. *Spondylurus semitaeniatus*, from the Virgin Islands. **(**A–D) ZMB 1238, holotype, restricted to St. John, U.S. Virgin Islands (no specific locality). Photographs courtesy of Mark-O. Rödel. (E) uncataloged, Virgin Gorda, British Virgin Islands (live individual, photographed by Alejandro Sanchez).

Material examined (n = 53). U.S. Virgin Islands. ZMB 1238 (holotype), from "America," type-locality restricted here to St. Thomas (no specific locality within island), U.S. Virgin Islands, ex. coll. Marcus Elieser Bloch, probably acquired 1779–1799 (examination of photographs) (see Remarks); MCZ R-36592–95 and UMMZ 73821, Chapman Grant, Little Buck Island, between 2 September 1931 and 18 April 1932; MCZ R-42380, Chapman Grant, Capella Island, 29 April 1936; UMMZ 80585, Chapman Grant, Little Buck Island, 15 March 1936; ZMH R09300–301, St. Thomas, "Calwood leg. 1885." British Virgin Islands. KU 242064, Albert Schwartz, Great Camanoe Island (between Lee Bay and Cam Bay), 20 August 1964; KU 242071, Albert Schwartz, Virgin Gorda (southeast part of island from Copper Mine Bay; no collection date available); KU 242072–73 and 242075–78, Albert Schwartz, Virgin Gorda (just north of Garden Rock; no collection date available); KU 242074 and 242079–81, Albert Schwartz, Virgin Gorda (inland margin of Salt Pond behind St. Thomas Bay; no collection date available); MCZ R-166975, James Lazell, Guana Island, 13 July 1984; MCZ R-170883, P. Shelby, Guana Island, 21 October 1984; MCZ R-176327, G. Proctor, Guana Island, 20 November 1986; MCZ R-176328, L. Phipps, Guana Island, 27 December 1987; MCZ R-176329, C. O. Connell, Guana Island (Shangri La), 19 July 1987; MCZ R-176330, E. Azevedo, Tortola (Zion Hill), 24 July 1987; MCZ R-176331, R. Jenkins and J. Randall, Necker Island, 25 July 1987; MCZ R-176332, R. Jenkins, Tortola (Sage Mountain), 30 August 1988; MCZ R-176739–43, “Hocking Tech,” Tortola (Sage Mountain), 30 June 1994; MCZ R-180273, M. Garcia, Little Thatch Island, 9 October 1994; MPM 26275, Virgin Gorda (inland margin of Salt Pond behind St. Thomas Bay); RT 947, D. C. Leber and R. Thomas, Virgin Gorda (inland margin of Salt Pond behind St. Thomas Bay), 17 August 1964; UMMZ 80581–82, 80584, and 239599–600, Chapman Grant, Virgin Gorda, 30 March–7 April 1936; MCZ R-182093, E. Henry, Tortola (Little Dicks Hill), July 1996; UMMZ 200131, Fred Kraus, Guana Island, 7 March 1991; UPRRP 5489, Island Project Staff, Salt Island, 24 May 1966; UPRRP 5503, Island Project Staff, Necker Island, 6 June 1966; UPRRP 5521–22, Island Project Staff, Virgin Gorda (Savanna Bay), 27 June 1966; USNM 304550, Ginger Island (near South Bay), 12 October 1975 (no collector information available); MCZ R-185692, Clive Petrovic, Mosquito Island, 3 October 2007; USNM 576304, K. Lindsay, Mosquito Island, 12 September 2007. West Indies. ZMUC-R 391, "?Botanical Garden", accessioned 1893.

Diagnosis. *Spondylurus semitaeniatus* is characterized by (1) maximum SVL in males, 74.7 mm; (2) maximum SVL in females, 82.9 mm; (3) snout width, 1.99–3.27% SVL; (4) head length, 15.8–19.4% SVL; (5) head width, 11.9–16.2% SVL; (6) ear length, 0.953–2.27% SVL; (7) toe-IV length, 8.33–12.0% SVL; (8) prefrontals, two (98%), four (2%); (9) supraoculars, three (1%), four (99%); (10) supraciliaries, three (2%), four (98%); (11) frontoparietals, two; (12) supralabial below the eye, five (28%), six (72%); (13) nuchal rows, one (14%), two (80%), three (6%); (14) dorsals, 57–65; (15) ventrals, 59–70; (16) dorsals + ventrals, 119–134; (17) midbody scale rows, 31–34; (18) finger-IV lamellae, 10–15; (19) toe-IV lamellae, 13–19; (20) finger-IV + toe-IV lamellae, 23–33; (21) supranasal contact, Y (96%), N (4%); (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (38%), N (62%); (24) parietal contact, Y (98%), N (2%); (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. semitaeniatus* differs from all other species except *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. lineolatus*, *S. monae* **sp. nov.**, and *S. sloanii* by having a higher dark dorsolateral stripe width/ middorsal stripe width ratio (1.54–3.36 versus 0.115–1.27 in those other species; Fig. 79). From *S. anegadae* **sp. nov.**, it differs by having a narrower, longer nostril (Fig. 58). It is separated from *S. culebrae* **sp. nov.** by having a shorter length of combined head scales (Fig. 62A). It is distinguished from *S. lineolatus* by having a longer head (head length 15.8–19.4% SVL versus 12.9–14.4% SVL in *S. lineolatus*) and by having two dark lateral stripes and two dark dorsolateral stripes (versus 10 dark stripes in *S. lineolatus*). From *S. monae* **sp. nov.**, *S. semitaeniatus* differs by having a shorter rostral scale (Fig. 61).

Additionally, *Spondylurus semitaeniatus* is distinguished from other species in the genus except *S. anegadae* **sp. nov.** and *S. lineolatus* by having a middorsal stripe that is similar in color to the pale dorsolateral stripes (versus a middorsal stripe that is darker in those other species; Figs. 55 and 73). It is separated from *S. fulgidus* by having a higher number of supraciliaries (3–4 versus five in *S. fulgidus*), fewer total digital lamellae (178–215 versus 238 in *S. fulgidus*), and nearly non-overlapping dorsals + ventrals (119–134 versus 108–120 in *S. fulgidus*). It differs from *S. macleani* (Fig. 55G) by having longer dark dorsolateral stripes. It is distinguished from *S. monitae* **sp. nov.** (Fig. 73A) by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales in *S. monitae* **sp. nov.**).

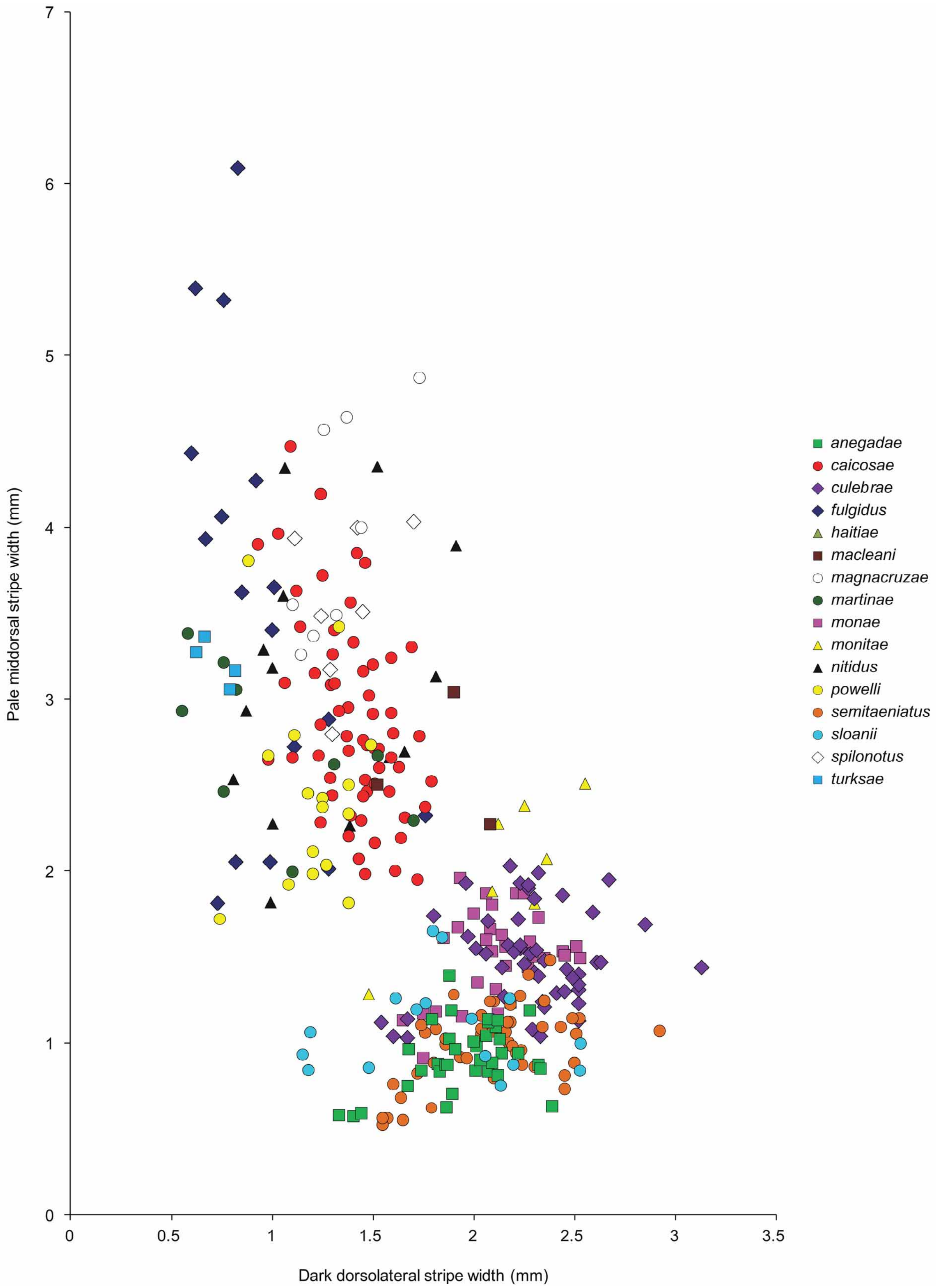

FIGURE 79. Graph of pale middorsal stripe width versus dark dorsolateral stripe width in 16 species of the Genus *Spondylurus*.

There are frequency differences that also separate *Spondylurus semitaeniatus* from other species. From *S. caicosae* **sp. nov.**, it differs by having a higher number of midbody scale rows (31–34 in 94% of specimens versus 27–30 in 92% of specimens belonging to *S. caicosae* **sp. nov.**). It differs from *S. martinae* **sp. nov.** by having fewer ventral scales (59–67 in 88% of specimens versus 68–71 in *S. martinae* **sp. nov.**).

The molecular phylogeny (Fig. 5) shows that *Spondylurus sloanii* is closer, genetically, to *S. culebrae* **sp. nov.**, *S. macleani*, and *S. monitae* **sp. nov.** than it is to *S. semitaeniatus*. However, the greatest confusion in identification of *S. semitaeniatus* will likely be with *S. sloanii* because the two species appear superficially similar and occur in close proximity and sympatry in the Virgin Islands. The most reliable character in separating these two species is the width of the dark dorsolateral stripes compared with the pale middorsal stripe as measured at the forelimbs instead of the normal location for this measurement, at the ears (Fig. 80A). In both species, the dark dorsolateral stripes taper posteriorly until they eventually disappear. However, in *S. sloanii*, the dark dorsolateral stripes start tapering more quickly, before the forelimbs (e.g., compare pattern in Fig. 78E with that in Fig. 81F). The dark dorsolateral stripe/middorsal stripe ratio (at the forelimbs) is 1.25–2.68 in *S. semitaeniatus* versus 0.43–1.08 in *S. sloanii*. A second useful character in separating the two species, although not 100% diagnostic in itself, is prefrontal separation (length of frontonasal-frontal suture). *Spondylurus semitaeniatus* has > 0.3% separation of prefrontals whereas more than two thirds of *S. sloanii* have contact between prefrontals, or are within 0.3% SVL of contact (Figure 80B). In other aspects of pattern, adult *S. semitaeniatus* usually differ from *S. sloanii* in having a pale middorsal stripe that is the same color as the pale dorsolateral stripes (darker than the pale dorsolateral stripes in *S. sloanii*), a dorsum that does not appear braided (versus dorsum with dark-edged scales giving a braided appearance in *S. sloanii*), and a pale lateral stripe (absent or barely evident in *S. sloanii*). Both species have been described as bronze or coppery, but the color of living and preserved *S. semitaeniatus* appears to be less so (more tan) than that of *S. sloanii*.

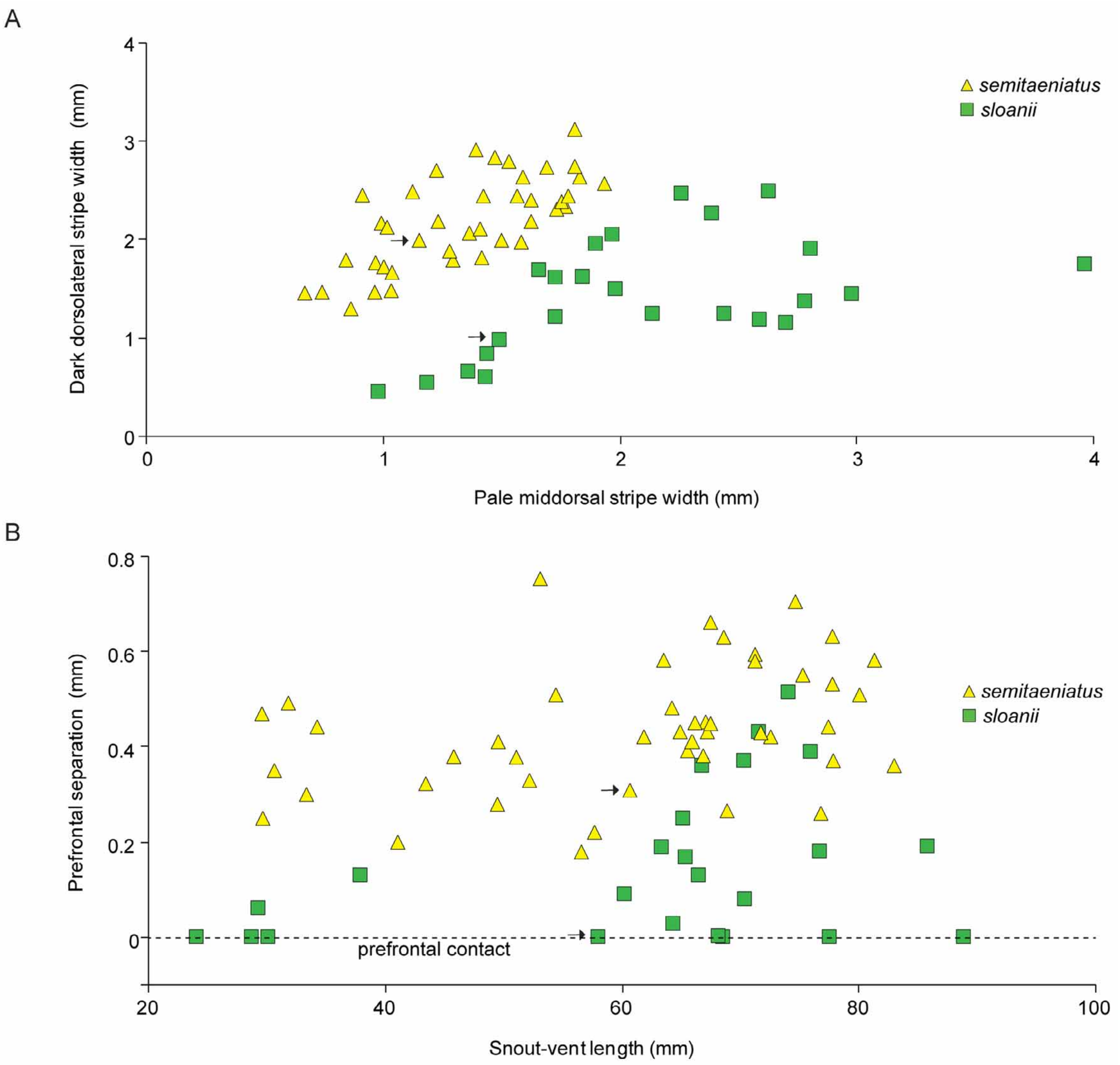

FIGURE 80. Graphs showing characters distinguishing *Spondylurus semitaeniatus* and *S. sloanii*. (A) Graph of dark dorsolateral stripe width versus pale middorsal stripe width, measured at level of forelimbs. (B) Graph of prefrontal separation (length of suture between frontonasal and frontal scales) versus snout-vent length. In both graphs, the lectotype of *S. semitaeniatus* and holotype of *S. sloanii* are indicated with arrows.

Description of holotype (Figs. 78A–D). Based on examination of photographs. An unsexed adult in moderate state of preservation, without injuries and without an abdominal slit. SVL 60.5 mm; tail length not measured (broken); HL, HW, SW, EL, and toe-IV length not measured; ear-opening average in size and oval; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first supraciliary, first and second supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye not distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin curved slightly toward tip of snout. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second and third pairs separated by a smaller cycloid scale.

Body and limb scalation. One row of paired nuchal scales and one additional right nuchal scale. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 60 in a longitudinal row; ventrals similar to dorsals; 65 in a longitudinal row; scales around midbody not counted. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, not countable on fingers or toes. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Pattern elements weakly defined because of age of specimen (232–212 years old). Dorsal ground color medium greenish-brown with no visible spots. Dark dorsolateral stripes present, wide (not measured), dark brown, extending from tip of snout to first third of body. Dark lateral stripes present, dark brown, extending from behind eye to first third of body (pattern no longer visible posterior to this point). Pale middorsal stripe present, narrow (not measured), medium greenish-brown, extending from tip of snout to first third of body. Pale dorsolateral stripes present, medium greenish-brown, extending from tip of snout to first third of body. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available for coloration of the holotype in life.

Variation. In scalation, most specimens resembled the holotype (Tables 4). In more recent material, where pattern was more visible, dorsal pattern varied in color and in distribution of small dark brown spots. Limbs appear darker than body, and forelimbs are usually mottled. A Virgin Gorda specimen (KU 242071) was noted by Albert Schwartz as having a copper to bronzy dorsum posteriorly, and venter bluish, becoming grayer posteriorly. A live animal also from Virgin Gorda (Fig. 78E) shows a tan or reddish tan dorsum with orange anteriorly in the zone of the dark lateral stripe (which appears broken and spotty).

Distribution. This species is widely distributed in the U.S. and British Virgin Islands (Fig. 10E). In the U.S. Virgin Islands it is known from St. Thomas, and from two islets of St. Thomas (Capella and Little Buck). In the British Virgin Islands it is known from Fallen Jerusalem (literature record), Ginger Island, Great Camanoe Island, Guana Island, Little Thatch Island, Mosquito Island, Necker Island, Round Rock (literature record), Salt Island, Tortola, and Virgin Gorda (MacLean *et al.* 1977; MacLean 1982; Lazell 1983; Schwartz & Henderson 1991; Lazell 1995). Reinhardt and Lütken (1863) mentioned the occurrence of skinks on St. John and Jost van Dyke, citing "Mr. Riises," = Albert Heinrich Riise, a Danish pharmacist and naturalist on St. Thomas. The only museum specimens that we could locate from those islands were two *Spondylurus spilonotus* from St. John (ZMUC-R 93–94). However, given the widespread occurrence of *S. semitaeniatus* in the Virgin Islands, that species probably occurred on those two islands.

Ecology and conservation. Recent reviews of the herpetofauna of the Virgin islands implicate the mongoose in declines and extirpations of skinks, especially from the large islands (Perry & Gerber 2006; Platenberg & Boulon 2006). On the small islets of St. Thomas (Little Buck Island, Capella Island) where *Spondylurus semitaeniatus* occurs, the habitat is mostly coastal shrub with introduced Guinea Grass *Panicum maximum*, Turks Cap Cactus *Melocactus intortus*, and the shrub *Oplonia spinosa*, interspersed with Sea Grape *Coccoloba uvifera*, the same as the habitat of *S. sloanii*. This habitat can be described as low shrubby vegetation or grass, including exposed rocky areas and occasional beaches (R. Platenberg, personal communication).

No specimens of *Spondylurus semitaeniatus* exist from the large island of St. John, but it probably occurred there, based on its distribution on surrounding islands. Two specimens of the larger species, *S. spilonotus*, are from St. John, collected in 1846, and that species has not been recorded there since, almost certainly having been extirpated by the mongoose. The same fate can be assumed for *S. semitaeniatus* on St. John. *Spondylurus semitaeniatus* has been observed in recent decades on mongoose-free islands such as Virgin Gorda, Guana, Little Buck, and Mosquito as well as mongoose-inhabited Tortola. There is general acceptance that it has declined in numbers (Perry & Gerber 2006; Platenberg & Boulon 2006), and continued development of the islands will reduce available habitat of a species already living a fragile existence. Some anecdotal evidence suggests that, while the mongoose is the primary factor responsible for decline in skink numbers in the Virgin Islands, it is not the only factor (see also the account for *S. magnacruzae* **sp. nov.**).

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus semitaeniatus* as Endangered (EN A2ace). It faces a primary threat from the introduced mongoose, which probably led to its extirpation on St. Thomas, and probably other islands where there are no museum records as evidence, such as St. John. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine the health of remaining populations, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. Three females (71.1–77.8 mm SVL) contained 2–4 (mean = 3) developing young. The date of collection for one specimens was 7 April 1936 (no collection dates available for the other specimens).

Etymology. Not provided in the original description. However, the species name (*semitaeniatus*) is a feminine singular adjective derived from the Latin *semi* (half) and *taenia* (ribbon, stripe), hence half-striped, referring quite accurately to the dorsal pattern of this species, although such a pattern is shared with most other species in the Genus *Spondylurus*.

Remarks. *Spondylurus semitaeniatus* is an old species name that has had a confusing history, some of which was clarified recently by Bauer *et al.* (2003). Until now the name has generally been considered a synonym of either *Spondylurus sloanii* or *Mabuya mabouya*. The type was acquired by Marcus Elieser Bloch (1723–1799) and was one of several specimens used by Schneider (1801) to describe *Scincus auratus*, a species now recognized by the name *Trachylepis aurata* (Linnaeus) and with a new lectotype (Moravec *et al.* 2006). The same specimen (ZMB 1238) was then used by Wiegmann (1837) to name *Euprepes semitaeniatus*. No locality was given for the holotype other than "America," which has led to some of the confusion. However, characters of this specimen (see above) associate it with specimens of Mabuyinae representing the species in the Virgin Islands with a relatively wide distribution.

Bloch had collaborators around the world that sent him material (Paepke 1999), and therefore it is unlikely, but not impossible, that he was the actual collector. His fish collection, at least, was amassed during 1779–1799 from a limited number of locations, with St. Croix being the only location in the entire Caribbean region mentioned (Paepke 1999). Thus we might assume from this information that the type of *Spondylurus semitaeniatus* was collected during 1779–1799, in the general region of St. Croix, and sent to Bloch. Because the only skinks known from St. Croix (and its islet Green Cay) are *Spondylurus magnacruzae* **sp. nov.** (records in several museums) and *Capitellum parvicruzae* **sp. nov.** (one specimen in ZMUC), we suspect that *S. semitaeniatus* never occurred there, and thus the type material was probably collected elsewhere. Saint Croix is an island isolated by an expanse of deep water from the remainder of the Virgin Islands, although much of its herpetofauna is shared with the Puerto Rico Bank (including the Virgin islands), indicating that overwater dispersal has been frequent in the recent past.

In the late 18th century, St. Croix, St. Thomas, and St. John were all owned by Denmark, and therefore nearby St. Thomas and St. John would be the next most likely places where the collectors for Bloch would have obtained the type specimen of *Spondylurus semitaeniatus*. Saint Thomas has always had a larger settlement and was a major hub in the region, and there are specimens of this species known from that island. Therefore, we restrict the type-locality of *S. semitaeniatus* to St. Thomas. If the specimen actually came from another location in the region (e.g., St. Croix or St. John), it would not affect the taxonomy of this or related species.

There has been some additional confusion surrounding the holotype of *Spondylurus semitaeniatus* as noted by Bauer *et al.* (2003). Peters (1864) correctly identified the type as ZMB 1238, but Stejneger (1904) listed it as ZMB 5290, an error repeated by later authors (Grant 1931; Dunn 1936; Schwartz & Thomas 1975; Schwartz & Henderson 1988). It is unclear whether Stejneger examined a different specimen or just listed the number incorrectly. He noticed that the pale middorsal stripe was very narrow, narrower than in what he was calling *Mabuya sloanii* (which included other species recognized here), leading him to consider *S. semitaeniatus* and *S. sloanii* different species. Relying on Stejneger's description of the holotype, Schmidt (1928) went further and associated *S. semitaeniatus* with the boldly-striped skinks from Culebra (here called *S. culebrae* **sp. nov.**). However, he did not feel strongly enough about the association to consider them distinct species and therefore placed *S. semitaeniatus* in the synonymy of *S. sloanii*. Grant (1931) went a step further and treated *S. semitaeniatus* as a distinct species, occurring only on Culebra and Mona islands (not mainland Puerto Rico), but he later reversed his decision and called them *S. sloanii* (Grant 1937).

Spondylurus sloanii **(Daudin 1803)**
Virgin Islands Bronze Skink
(Figs. 73E, 76C, 81)

Scincus sloanii—Daudin, 1803:287. Holotype by monotypy; holotype number and type-locality not stated.
Scincus sloanei—Merrem, 1820:70.
Spondylurus sloanei—Fitzinger, 1826:23.
Tiliqua sloanii—Gray, 1831:70.
Scincus richardi—Cocteau, 1837 (mentioned in Gray [1839:292] and in Duméril and Bibron [1839:639]; same specimen as type of *Scincus sloanii* Daudin; two brief extracts published by Cocteau [1837a,b] but apparently the full manuscript, with names, was never published).
Tiliqua richardi—Gray, 1838:292 (same specimen as type of *Scincus sloanii* Daudin).
Tiliqua sloanii—Gray, 1838:293.
Eumeces sloanii—Duméril & Bibron, 1839:639 (redescription of holotype of *Scincus sloanii* Daudin and restriction of type-locality to “Saint-Thomas,” collected by "Richard père" = Louis Claude Richard, probably in 1781–89; see Remarks).
Mabouya sloanei—Gray, 1845:94 (Jamaica, in error).
Mabuia cuprescens—Cope, 1862:186 (St. Thomas; holotype apparently lost).
E[uprepes] semitaeniatus—Peters, 1871:400 (part).
Mabuya sloanii—Bocourt, 1879:401 (part).
Mabuia sloanii—Garman, 1887 (Jamaica, in error; following Gray[1845]).
Mabuia nitida—Garman, 1887:51 (part, inferred).
Mabuia sloanii—Boulenger, 1887:193 (part, inferred).
Mabuia sloanii—Meerwarth, 1901:37.
Mabuya sloanii—Stejneger, 1904:608 (part).
Mabuya sloanii—Barbour, 1914:320 (part).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya sloanii—Grant, 1937:517 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:30–34 (part).
Mabuya mabouya sloanei—Heatwole *et al.*, 1981:34 (part).
Mabuya mabouya sloanii—Brygoo, 1985:101 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

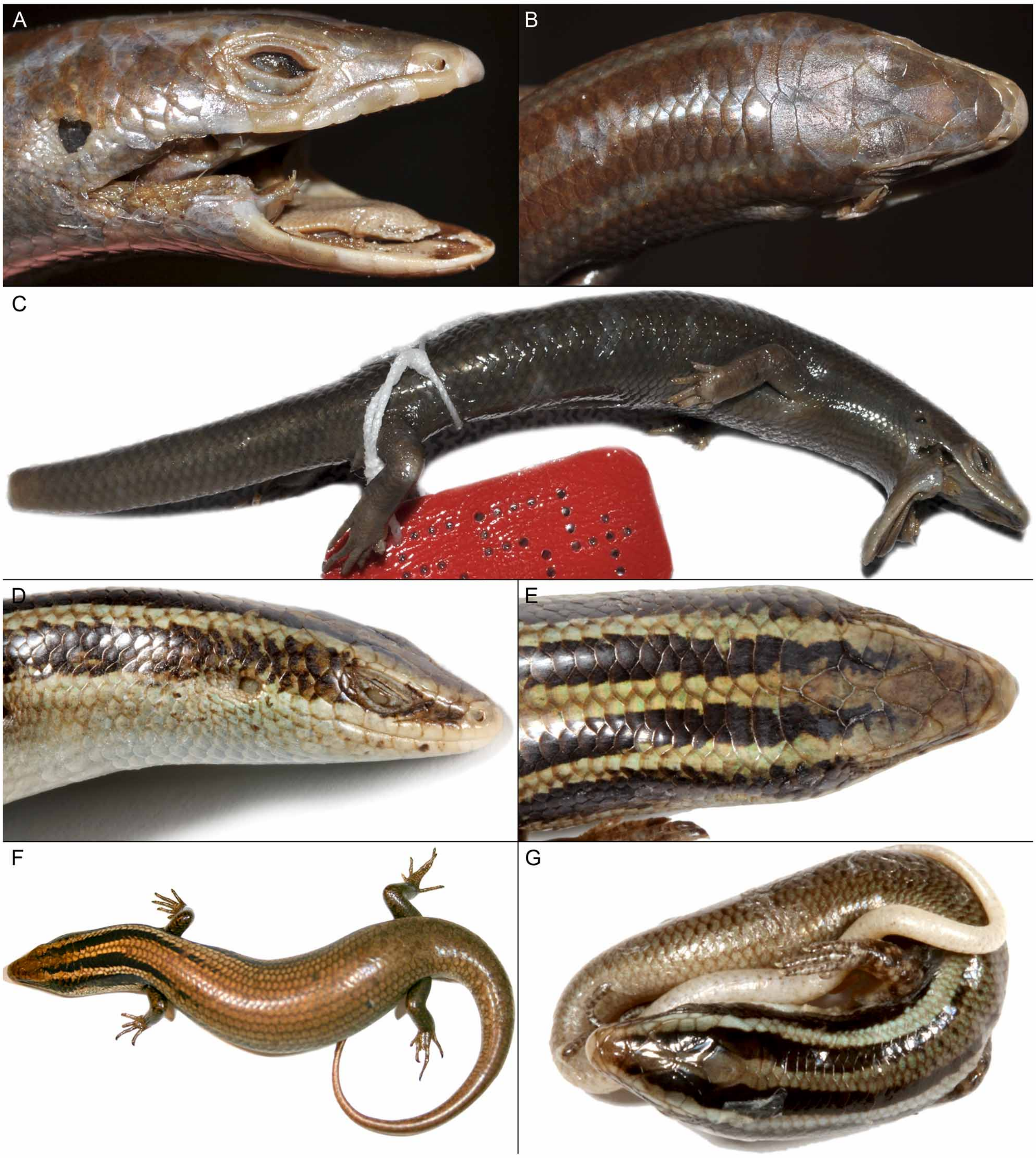

FIGURE 81. *Spondylurus sloanii*, from the Virgin Islands. (A–C) MNHN 554, holotype, St. Thomas, U.S. Virgin Islands. Photographs courtesy of Ivan Ineich. (D–F) USNM 576305, Little Saba Island, St. Thomas (F = live). (G) fetus of USNM 576305.

Material examined (n = 24). British Virgin Islands. KU 242065–70, Albert Schwartz, Peter Island (Little Harbour), 13 August 1964; MCZ R-158940, James Lazell, Little Tobago Island, 27 March 1980; MCZ R-178430, P. Gagne, Norman Island (The Bight), 21 October 1993; MCZ R-182273, C. O'Connell, Peter Island (Stoney Bay), 17 July 1988; UMMZ 74427, Chapman Grant, Salt Island, 10–17 August 1932. U.S. Virgin Islands. MNHN 554 (holotype), "Richard père" = Louis Claude Richard, St. Thomas, U.S. Virgin Islands, probably 1781–89 (examination of photographs); UMMZ 80580, Chapman Grant, Little Saba Island, 19 April 1936; UMMZ 80586, Chapman Grant, Capella Island, 29 April 1936; UMMZ 239605, Chapman Grant, Little Buck Island, 18 April 1932; USNM 576305, 576306–576309 (mother and 4 well-developed fetuses), Daniel Nellis, Little Saba Island, 22 April 2004; KU 242175, Albert Schwartz, Water Island, Eastside, 25 July 1964; ZMUC-R 761–763, A. H. Riise, St. Thomas, accessioned 1862. West Indies. ZMUC-R 760, A. H. Riise, accessioned 1862.

Material not examined (n = 2). U.S. Virgin Islands. MNHN 1088, from St. Thomas (no specific locality), described and figured by Bocourt (1879) (this specimen was collected before 1879 and, based on low accession number, probably in the late 18th or early 19th century); holotype of *Mabuia cuprescens* Cope (1862), from St. Thomas (no specific locality), collected by "A. H. Rüse," no date or catalog number given, type apparently lost (probably collected by Albert Heinrich Riise around 1862, but between 1838–1862; see Remarks).

Diagnosis. *Spondylurus sloanii* is characterized by (1) maximum SVL in males, 71.6 mm; (2) maximum SVL in females, 88.9 mm; (3) snout width, 2.10–3.11% SVL; (4) head length, 15.2–19.2% SVL; (5) head width, 11.8–13.9% SVL; (6) ear length, 1.12–1.73% SVL; (7) toe-IV length, 8.05–11.2% SVL; (8) prefrontals, two (95%), four (5%); (9) supraoculars, three (2%), four (98%); (10) supraciliaries, three (5%), four (95%); (11) frontoparietals, two; (12) supralabial below the eye, five (18%), six (77%), seven (5%); (13) nuchal rows, one (15%), two (75%), three (10%); (14) dorsals, 59–64; (15) ventrals, 58–68; (16) dorsals + ventrals, 118–131; (17) midbody scale rows, 32–34; (18) finger-IV lamellae, 10–13; (19) toe-IV lamellae, 14–17; (20) finger-IV + toe-IV lamellae, 24–30; (21) supranasal contact, Y (95%), N (5%); (22) prefrontal contact, Y (33%), N (67%, although nearly all in near contact); (23) supraocular-1/frontal contact, Y (38%), N (62%); (24) parietal contact, Y (95%), N (5%); (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, N (or weak); and (29) palms and soles, pale (Tables 3–5).

Spondylurus sloanii differs from *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. nitidus*, *S. powelli* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having a narrower middorsal stripe (1.11–2.42% SVL versus 2.61–10.4% in those other species). It differs from all other species except *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. lineolatus*, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, and *S. semitaeniatus* by having a higher dark dorsolateral stripe width/middorsal stripe width ratio (1.09–2.96 versus 0.115–0.916 in those other species; Fig. 79). *Spondylurus sloanii* is distinguished from *S. lineolatus* and *S. turksae* **sp. nov.** by having a higher number of midbody scale rows (32–34 versus 26–30 in those other species). From *S. macleani*, it differs by having distinct dark lateral stripes (versus dark lateral stripes barely evident or absent in *S. macleani*). It is separated from *S. fulgidus* by having a higher number of dorsals (59–64 versus 52–58). From *S. haitiae* **sp. nov.**, it differs by having fewer ventral scales (58–68 versus 69–72 in *S. haitiae* **sp. nov.**). From *S. monae* **sp. nov.**, it differs by having a taller rostral scale: rostral height/length 1.26–1.71 versus 0.84–1.01 in *S. monae* **sp. nov.** (Fig. 61). It is separated from *S. monitae* **sp. nov.** by having straighter dark dorsolateral stripes (versus dark dorsolateral stripes that bow inward on the parietal scales in *S. monitae* **sp. nov.**; Fig. 73A, E) and in having a high frequency (95%) of supranasal contact (versus no contact in *S. monitae* **sp. nov.**). Additionally, *S. sloanii* is a larger species (maximum SVL 88.9 mm) than *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. macleani*, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. powelli* **sp. nov.**, *S. semitaeniatus*, and *S. turksae* **sp. nov.** (maximum SVL 63.7–85.9 mm in those other species). *Spondylurus sloanii* differs from *S. anegadae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. magnacruzae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. spilonotus*, and *S. turksae* **sp. nov.** by having fewer total lamellae (190–198 versus 202–238 in those other species), although sample sizes are lower for this character (Table 4).

Within the Genus *Spondylurus*, *S. sloanii* is separated from most species by having a high frequency (67%) of prefrontal contact or near contact (prefrontal separation within 0.3% SVL = ~0.2 mm). One-third of specimens (eight of 24) have contact between prefrontals, which is generally rare in Mabuyinae (6% overall). In other species of *Spondylurus*, prefrontal contact is common only in *S. fulgidus* (52%) and *S. haitiae* **sp. nov.** (50%); uncommon or rare in *S. anegadae* **sp. nov.** (3%), *S. lineolatus* (11%), *S. martinae* **sp. nov.** (11%), and *S. powelli* **sp. nov.** (25%); and not observed in *S. caicosae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, *S. semitaeniatus*, *S. spilonotus*, and *S. turksae* **sp. nov.**

From its closest relative, *S. culebrae* **sp. nov.** (Fig. 55C), *S. sloanii* (Fig. 73E) is distinguished by having shorter dark dorsolateral stripes (tapering at or before forelimbs versus posterior to forelimbs), shorter dark lateral stripes (extending to midbody versus to hindlimbs), in having limbs with only small dark spots (boldly mottled or barred in *S. culebrae* **sp. nov.**), and in lacking a pale lateral stripe (present and distinct in *S. culebrae* **sp. nov.**). Also, it has fewer finger-IV + toe-IV lamellae (24–29 in 91% of *S. sloanii*, versus 30–34 in 81% of *S. culebrae* **sp.**

nov.) and is a smaller species, with a mean of 70.8 mm SVL (19 adults) compared with *S. culebrae* **sp. nov.** (mean = 82.1 mm SVL, 45 adults).

The molecular phylogeny (Fig. 5) shows that *Spondylurus sloanii* is closer, genetically, to *S. culebrae* **sp. nov.**, *S. macleani*, and *S. monitae* **sp. nov.** than it is to *S. semitaeniatus*, but the greatest confusion in identification will likely be with the latter species because the two (*S. sloanii* and *S. semitaeniatus*) appear superficially similar and occur in close proximity and sympatry in the Virgin Islands. The most reliable character in separating these two species is the width of the dark dorsolateral stripes compared with the pale middorsal stripe as measured at the forelimbs instead of the normal location for this measurement, at the ears (Fig. 80A). In both species, the dark dorsolateral stripes taper posteriorly until they eventually disappear. However, in *S. sloanii*, the dark dorsolateral stripes start tapering more quickly, before the forelimbs (e.g., compare pattern in Fig. 78E with that in Fig. 81F). The dark dorsolateral stripe/middorsal stripe ratio is 0.43–1.08 in *S. sloanii* and 1.25–2.68 in *S. semitaeniatus*. A second useful character in separating the two species, although not 100% diagnostic, is prefrontal separation, already noted above. More than two thirds of *S. sloanii* have contact between prefrontals, or are within 0.3% SVL of contact, versus all *S. semitaeniatus* with > 0.3% separation of prefrontals (Figure 80B). In other aspects of pattern, adult *S. sloanii* usually differ from *S. semitaeniatus* in having a pale middorsal stripe that is darker than the pale dorsolateral stripes (versus the same color as the dorsolateral stripes in *S. semitaeniatus*), a dorsum with dark-edged scales giving a braided appearance (versus lacking a braided appearance in *S. semitaeniatus*), and in lacking a pale lateral stripe, or having one that is barely evident (versus having a distinct pale lateral stripe in *S. semitaeniatus*). Both species have been described as bronze or coppery, and more observations are needed, but the color of living and preserved *S. sloanii* appears to be more bronze or coppery than that of *S. semitaeniatus*.

Description of holotype (Fig. 81A–C). The following is based on examination of photographs supplied by MNHN (I. Ineich, personal communication). Absolute measurements could not be taken accurately from the photos, but diagnostic pattern ratios were scorable. An unsexed adult in moderate state of preservation, with broken tail—complete when examined by Duméril and Bibron (1839)—cuts to jaw, and an abdominal slit. SVL 64.0 mm (Brygoo 1985); tail length not measured (broken); ear-opening large in size and round; toe length order not recorded.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals in median contact, contacting anteriormost loreal. Frontonasal biconvex, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, in contact medially, and in contact with frontonasal, both anterior and posterior loreals (which appear to be fused), first supraciliary, first and second supraoculars, and frontal. Frontal hexagonal, oblong and semi-lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal, near-triangular, separated from nuchals by parietals; parietal eye not distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals fused into one roughly rectangular scale. Two or three upper preoculars and two lower preoculars. A single row of small scales across the dorsal edge of the eyelid window. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller (except for one large primary postocular). One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin curved slightly toward tip of snout. Postmental scale and two pairs of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair damaged; third pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of paired nuchal scales. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, not counted; ventrals similar to dorsals; not counted; scales around midbody not countable in photographs. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, not countable on finger-IV or toe-IV. Preanal scales similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium brownish-gray with small dark brown spots, distributed on body and limbs. Dark dorsolateral stripes present, wide at ear level, dark brown, extending from the nuchal scales (anterior to which the pattern is no longer visible because external, pigmented layer of scales is missing on most of head) to first third of body, tapering distinctly anterior to forelimbs. The dark dorsolateral stripe/middorsal stripe ratio at ear level is 2.45 and at forelimbs is 0.658. Dark lateral stripes present, dark brown, visible from behind eye to first third of body (although faded and difficult to discern). Pale middorsal stripe present, narrow at ear level, medium brownish-gray, visible from nuchal scales to first third of body. Pale dorsolateral stripes present, pale gray, visible from nuchal scales to first third of body. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information is available on color in life; however, color and pattern of the 230–222-year-old specimen was described by Duméril and Bibron (1839) only ~50 years after it was preserved. They recorded a greenish-bronze dorsum with two black dorsolateral stripes beginning on the supraocular region and ending in the first half of the back and replaced with a series (lines) of black dots on the second half of the back. The lateral stripes were described as similarly fading into a double or triple series of dots and extending to the hindlimbs. The venter was recorded as glossy greenish-gray. Of possible diagnostic importance is their comment that scales not colored black have a light brown edge. This was also noticed in the recently collected specimens from Little Saba (Fig. 81E) and conveyed an overall braided appearance not seen in *Spondylurus semitaeniatus*.

Variation. In pattern and scalation, most specimens resembled the holotype, with dorsal ground color varying from grayish-brown to greenish-brown (Tables 4–5). Limbs appear slightly darker than body. Dark dorsolateral stripes taper before the forelimbs and dark lateral stripes extend one-third of body or midbody. Pale lateral stripes, which are present in most species of *Spondylurus*, are absent (or weakly defined) in *S. sloanii*. Albert Schwartz recorded the color in life of Peter Island specimens as having a "tannish-brown" and "not metallic" dorsum, pale stripes "creamy" anteriorly, and venter "pale yellowish-tan"; he described the Water Island specimen as having its dorsum "tannish bronze," pale dorsolateral stripes "dull creamy," and venter "dirty cream." The color in life of the large adult from Little Saba is bronze or coppery (e.g., Fig. 81F). Overall, we find that *S. sloanii* tends to be more bronze and coppery than *S. semitaeniatus*, which is usually tan (greenish in preservative), although more information on color in life is needed. The greenish or bluish color seen in preserved specimens is an artifact of preservation.

Distribution. The species is known from the British and U.S. Virgin Islands (Fig. 10E). In the British Virgin Islands it is known from Little Tobago, Norman Island, Peter Island, and Salt Island. From the U.S. Virgin Islands it is known from St. Thomas and its islets of Capella Island, Little Buck Island, Little Saba Island, and Water Island.

Ecology and conservation. The species has not been recorded from St. Thomas since 1862, although it still likely occurs on the smaller mongoose-free islands within its distribution. The most recent sighting of the species (2004) was on Little Saba. There, the habitat is mostly coastal shrub with introduced Guinea Grass *Panicum maximum*, Turks Cap Cactus *Melocactus intortus*, and the shrub *Oplonia spinosa*, interspersed with Sea Grape *Coccoloba uvifera*. This habitat can be described as low shrubby vegetation or grass, including exposed rocky areas and occasional beaches (R. Platenberg, personal communication). Little Saba is a wildlife refuge, but its small size—essentially constituting one population of the skink—and presence of introduced mice pose a threat (R. Platenberg, personal communication). Albert Schwartz found the Peter Island specimens under objects (leaves, rocks) near the coast, and the Water Island specimen under driftwood on a cobble beach. Molecular phylogenetic analyses are needed to determine whether the skinks from these diverse islands all belong to *Spondylurus sloanii*, as they appear to based on morphology. Also, the current existence of the skink on Water Island, known from a single specimen collected in 1964, should be verified in that the mongoose apparently was released there between 1930 and 1983 (Barbour 1930a; Horst *et al.* 2001).

Based on IUCN Redlist criteria (IUCN 2011), the conservation status of *Spondylurus sloanii* is Endangered (EN A2ace). It faces a primary threat from the introduced mongoose, which probably led to its extirpation on St. Thomas and other islands on which it may have occurred (e.g., St. John, St. Croix) and are now inhabited by mongooses. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine the health of remaining populations, and threats to the survival of the species. Captive breeding programs should be considered, as well as studies on the genetic relationships of populations.

Reproduction. The female collected on 22 April 2004 (88.9 mm SVL) contained four developing young (Fig. 81G). They measured 24.1–30.2 mm SVL and appeared nearly fully developed. The female collected 18 April 1932 (77.6 mm SVL) also contained four young.

Etymology. The species (*sloanii*) was named in honor of Sir Hans Sloane (1660–1753), a British physician who studied the natural history of the West Indies, describing a skink from Jamaica which Daudin (1803) believed to be the same species as the specimen he described from St. Thomas.

Remarks. *Spondylurus sloanii* is the second oldest name in the Subfamily Mabuyinae, recognized as a valid species here, and, as expected, it has had a long and confused history. Daudin (1803) described the species based on a visit to the MNHN in Paris, where he saw the specimen. He did not mention locality or catalog number—not uncommon at that time—but focused rather on its unusual appearance (to him) in having three (pale) stripes. He compared it with other lined skinks, citing descriptions in Schneider (1799, 1801). He mentioned that it was brownish above and whitish below, with four dark stripes starting at the snout tip and continuing to the mid-body. Of importance here (diagnostically) is that he stated that two dark stripes, "a little more narrow, continue to the mid-back" (English translation). Such narrow, dark dorsolateral stripes distinguish *S. sloanii* from skinks on most of the remaining Virgin Islands (*S. semitaeniatus*), where the dorsolateral stripes are more similar in width to the lateral stripes. Daudin also illustrated the holotype, which shows a wide dark lateral stripe and narrow dark dorsolateral stripes. Daudin (1803) compared the specimen with a Jamaican skink described and figured by Sir Hans Sloane in his book on the natural history of Jamaica (Sloane, 1725), hence Daudin's (1803) recognition of Sloane in the name of the species. This apparently led Gray (1845) to state that the species was confined to Jamaica, an error repeated by Garman (1887), although it had been corrected by Duméril and Bibron (1839).

Duméril and Bibron (1839) cleared up some of the confusion by describing the type specimen in the MNHN more thoroughly and stating the locality ("Saint-Thomas") and collector: "Richard père." Richard père was almost certainly Louis Claude Richard (1754–1821), a French botanist who collected plants in French possessions in the Americas, including the Caribbean islands, during 1781–89 and then returned to France (Anonymous 2011). This information constrains the date of collection of the holotype of *Spondylurus sloanii* to 1781–89, about a decade before it was examined by Daudin (1803) for the description.

Duméril and Bibron (1839:642) noted that their description "is from the same individual" described by Daudin, thus fixing the type-locality and collector; confirmed later by Bocourt (1879) and by the similarity in SVL measurements given by Daudin (~66 mm, converted), Duméril and Bibron (65 mm), and Brygoo (1985) (64 mm). Even prior to Duméril and Bibron (1839), Gray (1831) described *Tiliqua richardi* based on the same specimen (Daudin's holotype), indicating it was from St. Thomas and in the Paris Museum. That specimen exists today and is MNHN 554, a number that first appeared in the literature much later (Schwartz & Thomas 1975; Brygoo 1985; Schwartz & Henderson 1988; Miralles 2005). Bocourt (1879):plate 22B, figure 3) did not mention the specimen catalog numbers but illustrated two specimens of *Spondylurus sloanii* Daudin: one from "Saint-Thomas" and the other "collected by Richard père" (showing only head scales). The text of Bocourt and records of the MNHN show that the specimen illustrated from "Saint-Thomas" is MNHN 1088, obtained from the Museum of Copenhagen, and the specimen collected by Richard père is the holotype, MNHN 554. Bocourt's illustration of MNHN 1088 shows relatively narrow dark dorsolateral stripes and point contact of prefrontals, which agrees with St. Thomas material and not *S. semitaeniatus*. The second (holotype) shows broad contact of prefrontals, again agreeing with other St. Thomas material (i.e., Cope's lost holotype of *Mabuia cuprescens* and recent material from St. Thomas). The holotype was also illustrated by Miralles (2005) and photographs of it are shown here (Fig. 81A–C).

The molecular phylogeny (Fig. 5) also supports the species distinction of *Spondylurus sloanii* and *S. semitaeniatus*: *S. sloanii* (represented in the tree by three specimens from Little Saba) is more closely related to *S. macleani*, *S. culebrae* **sp. nov.**, and *S. monitae* **sp. nov.** than to *S. semitaeniatus*. The diagnostic characters in the types of *S. sloanii* and *S. semitaeniatus* (Fig. 80) agree with the specimens used in the molecular phylogenies and other material assigned here to those species. Nonetheless, more material of *S. sloanii* is needed to better characterize the species. Of the 18 adults of *S. sloanii* that we had available, two (ZMUC-R 761 and USNM 576305) were larger (86 and 89 mm SVL, respectively) than all 64 of the *S. semitaeniatus* we examined (83 mm SVL, maximum), suggesting that it is a larger species. In coloration, the fresh adult specimen, USNM 576305, and its four well-developed fetuses (USNM 576306–309) differ from *S. semitaeniatus* in having a bronze, braided appearance where each scale has a dark edge (tan and not braided in *S. semitaeniatus*), and the pale middorsal stripe is distinctly darker than the pale dorsolateral stripes (usually the same color in adult *S. semitaeniatus*).

Another question concerns the status of the mabuyine skinks on the islands of Water, Capella, and Little Buck off of St. Thomas (Little Buck should not be confused with Buck island off of St. Croix). Little Buck and Little Saba are both only about 3–4 km away from St. Thomas, and Water Island is even closer (500 m). Although it may seem unusual that different species of skinks inhabit these small islets of St. Thomas, the alsophine snakes of those islands show taxonomic differentiation as well: Little Saba and Water Island share with St. Thomas the subspecies *Borikenophis portoricensis richardi* whereas Little Buck has a different (endemic) subspecies, *B. p. nicholsi* (MacLean 1982; Schwartz & Henderson 1991; Hedges *et al.* 2009).

Cope (1862a) described *Mabuia cuprescens* based on a specimen from St. Thomas, obtained from "Mr. A. H. Rüse," now apparently lost. The collector was undoubtedly Albert Heinrich Riise (1810–1882), a prominent Danish pharmacist and naturalist active in St. Thomas after his arrival in 1838, thus dating the collection between 1838–1862. Cope's description accurately pertains to *S. sloanii*, including the character he noted as being important: frontal scale not truncate anteriorly. This is another way of saying that the prefrontals are in contact, a character of *S. sloanii*. Cope also noted the coppery color (hence the species name *cuprescens*), which, although certainly not unique to *S. sloanii*—many skinks are characterized and even named after their metallic, bronzy, or coppery coloration—appears more striking than in the several geographically proximal species. Cope further described the dark dorsolateral bands as being "narrow" (relative to the lateral bands described), which again is consistent with *S. sloanii* and not *S. semitaeniatus*.

Spondylurus spilonotus **(Weigmann 1837) comb. nov.**

Greater Virgin Islands Skink

(Figs. 73F, 76D, 82)

Euprepes spilonotus—Wiegmann, 1837:135 (no locality, ex. coll. "Meyer"; but see Remarks).
Euprepes spilonotus—Peters, 1864:50 (lectotype clarified as ZMB 1240, same specimen as examined by Schneider [1801:182], for syntype of *Scincus auratus*; originally from collection of Meyer; no paralectotypes).
Eupr[epes] spilonotus—Peters, 1871:400 (Jamaica, in error).
Euprepes (Mabuia) spilonotus—Peters, 1876:708 (part).
Euprepes spilonotus—Gundlach, 1881:311 (part).
Mabuia sloanii—Boulenger, 1887:193 (part).
M[abuya] spilonotus—Stejneger, 1904:609–10 (listed incorrect accession number for lectotype; restriction to Jamaica, in error).
Mabuya sloanii—Barbour, 1914:355 (part).
Mabuya spilonota—Barbour, 1914:355 (restriction to Jamaica, in error).
Mabuya sloanii—Schmidt, 1928:121 (part).
Mabuya sloanii—Barbour, 1930:105 (part).
Mabuya mabouia—Barbour, 1935:129 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part; listed incorrect accession number for lectotype).
Mabuya mabouia—Barbour, 1937:147 (part).
Mabuya sp.— Grant, 1937:512 (part).
Mabuya spilonotus—Grant, 1940:111 (Jamaica, in error; listed incorrect accession number for lectotype).
Mabuya spilonotus—Murray, 1949:128 (Jamaica, in error).
Mabuya spilonota—Cochran, 1961:126 (Jamaica, in error).
Mabuya spilonota—Horton, 1973:85 (Jamaica, in error).
Mabuya mabouya sloanei— Schwartz & Thomas, 1975:141 (part; listed incorrect accession number for lectotype).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:30 (part).
Mabuya mabouya sloanei—MacLean *et al.*, 1977:32 (part).
Mabuya mabouya sloanei— Schwartz & Henderson, 1988:151 (part; listed incorrect accession number for lectotype).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al.*, 1996:82 (part).
Mabuya sloanii—Mayer & Lazell, 2000:883 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Material examined (n = 6). U.S. Virgin Islands. ZMB 1240 (lectotype; images examined), type-locality restricted here to St. Thomas or St. John, coll. 1779–1799 (see Remarks); ZMH R09299, A. H. Riise, St. Thomas, 1877; ZMUC-R 91–92, P. E. Benzon, "probably St. Croix" (considered here to be from St. Thomas or St. John; see Remarks for *Spondylurus magnacruzae* sp. nov.), accessioned 4 September 1834; ZMUC-R 93–94, Professor A. S. Oersted, St. John, collected 1845–46 (see Remarks) and accessioned 27 June 1846.

Diagnosis. *Spondylurus spilonotus* is characterized by (1) maximum SVL in males, 91.7 mm; (2) maximum SVL in females, 106.5 mm; (3) snout width, 2.74–3.05% SVL; (4) head length, 15.4–18.5% SVL; (5) head width, 12.0–13.9% SVL; (6) ear length, 1.76–2.05% SVL; (7) toe-IV length, 7.30–10.5% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four; (11) frontoparietals, two; (12) supralabial below the eye, six; (13) nuchal rows, two (67%), three (33%); (14) dorsals, 62–64; (15) ventrals, 63–68; (16) dorsals + ventrals, 125–132; (17) midbody scale rows, 34; (18) finger-IV lamellae, 13–15; (19) toe-IV lamellae, 16–18; (20) finger-IV + toe-IV lamellae, 29–33; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (17%), N (83%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, Y; and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. spilonotus* is distinguished from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. macleani*, *S. martinae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.287–0.464 versus 0.500–3.79 in those other species; Fig. 79). It differs from *S. anegadae* **sp. nov.**, *S. caicosae* **sp. nov.**, *S. fulgidus*, *S. haitiae* **sp. nov.**, *S. lineolatus*, *S. nitidus*, and *S. turksae* **sp. nov.** by having a higher number of midbody scale rows (34 versus 26–33 in those other species). It is separated from *S. anegadae* **sp. nov.**, *S. macleani, S. powelli* **sp. nov.**, *S. sloanii* and *S. turksae* **sp. nov.** by having a distinct pale lateral stripe (absent or barely evident in those species). From *S. fulgidus*, it differs by having a lower number of supraciliaries (four versus five in *S. fulgidus*). It differs from *S. lineolatus* by having a larger head (head length 15.4–18.5% SVL versus 12.9–14.4% in *S. lineolatus*) and four major dark stripes (lateral and dorsolateral) instead of 10 dark pin stripes. From *S. monitae* **sp. nov.**, it differs by having a higher number of supralabials (supralabial six below the eye versus supralabial five in *S. monitae* **sp. nov.**) and in lacking the guitar-shaped dark dorsolateral stripe pattern as on the parietal scales of *S. monitae* **sp. nov.** It differs from *S. monae* **sp. nov.** by having a higher number of midbody scale rows (34 versus 28–33 in 91% of specimens belonging to *S. monae* **sp. nov.**). From *S. anegadae* **sp. nov.**, it differs in lacking supranasal contact (versus contact in that species) and is much larger (maximum SVL, 107 mm versus 70.4 mm in *S. anegadae* **sp. nov.**).

Spondylurus spilonotus most closely resembles *S. magnacruzae* **sp. nov.**, which occurs (or occurred) on St. Croix. Both species reach 107 mm SVL in the relatively small samples available, making them the largest species in the Genus *Spondylurus*. They also have a similar general pattern consisting of narrow dark dorsolateral stripes in the anterior portion of the body. However, *S. spilonotus* has more dorsal body spots (52–99 versus 3–37), a shorter supraciliary-1 scale (supraciliary-1/supraciliary-2 length ratio 0.35–0.50 versus 0.52–0.69; Fig. 69A), and a larger ear (ear length 1.76–2.05% SVL versus 1.49–1.72%; Fig. 69B). Also, the stripe pattern of *S. spilonotus* appears faded and with more irregular edges to the stripes, compared with that of *S. magnacruzae* **sp. nov.** (bold stripes with straighter edges), features not obviously related to age of the specimens or differences in preservation.

Description of lectotype (Fig. 82A–D). The following is from our examination of detailed images of ZMB 1240. Some measurements and characters are omitted because they could not be taken accurately from the photographs. An unsexed adult in good state of preservation, without injuries and without an abdominal slit. SVL ~70 mm; tail length (complete) ~110 mm; HL ~13.0 mm; ear-opening round; fingers and toes clawed.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in full contact (close), contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale. A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior and posterior loreals, first and second supraoculars, and frontal. Frontal heptagonal and lanceolate, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal near-triangular, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars, the second one being the longest and largest. Four supraciliaries, the second the longest. Nostril in posterior part of the nasal. Postnasal bordered by supranasal, anterior loreal and first supralabial. Anterior loreal rectangular and posterior loreal squarish with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Eight supralabials, the sixth being the widest and forming the lower border of the eyelid. Five moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller, except primary postocular similar in size to primary temporal. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Eight infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one or two pairs of adjoining chin shields in contact with anterior infralabials. First two pairs of chin shields in contact medially; third pair separated by a smaller cycloid scale.

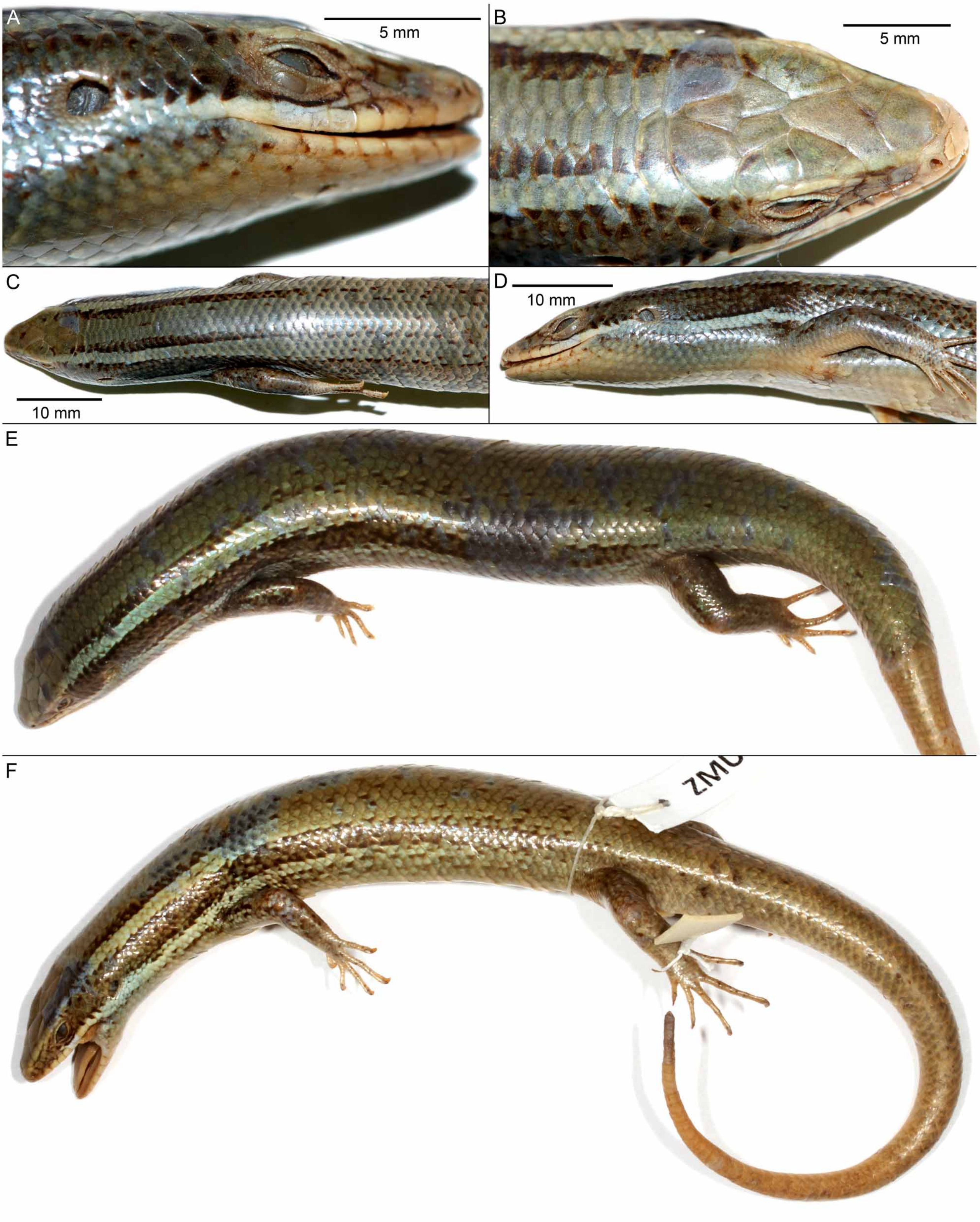

FIGURE 82. *Spondylurus spilonotus*, from St. Thomas and St. John, U.S. Virgin Islands. (A–D) ZMB 1240, lectotype, restricted here to St. Thomas or St. John, U.S. Virgin Islands (no specific locality). Photographs courtesy of Mark-O. Rödel. (E) ZMH R09299, St. Thomas (no specific locality). (F) ZMUC-R 93, St. John (no specific locality).

Body and limb scalation. Three rows of nuchal scales, two paired (three scales on left, two on right). Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 62 in a longitudinal row; ventrals similar to dorsals; 64 in a longitudinal row. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Six preanals similar to ventrals. No enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color pale gray-green with small dark brown spots distributed sparsely on head, body, limbs, and tail. Limbs darker than ground color and forelimbs with denser spotting. Dark dorsolateral stripes present, narrow, dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown with paler spots increasing from the forelimbs to the hindlimbs, extending from loreal region to last third of body. Pale middorsal stripe present, wide, pale gray-green, extending from top of head to first third of body. Pale dorsolateral stripes present, whitish, extending from top of head to first third of body. Pale lateral stripes present, whitish, extending from below eye to last third of body, bordered below by a narrow dark line. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. There is no information on color in life of the holotype.

Variation. In coloration, most specimens resembled the lectotype, except that the dorsal ground color varied from pale gray-green to darker green or brown, and some specimens had more dark brown dorsal spots than the holotype and shorter lateral stripes (Table 5).

Distribution. This species is distributed in the U.S. Virgin Islands, on St. John (52 km^2) and St. Thomas (77 km^2) (Fig. 10E).

Ecology and conservation. This species reached 107 mm maximum SVL and was sympatric with *Spondylurus semitaeniatus* (83 mm, maximum SVL) and *S. sloanii* (89 mm, maximum SVL) on St. Thomas and probably with both species on St. John (no specimens of those two species have been collected on St. John, but they are presumed to have occurred there based on their distribution on surrounding islands (Fig. 10E). It is possible that *S. spilonotus* occurred in the British Virgin Islands as well. Unfortunately very little collecting was done on islands other than St. Thomas and St. Croix prior to the introduction of the mongoose in the late 19th century, so it could have been easily extirpated from many islands without any record.

Spondylurus spilonotus has not been seen since the last specimen was cataloged in 1877, despite considerable herpetological survey work throughout the Virgin Islands. The presence of the introduced mongoose on the two islands where *S. spilonotus* is known to have occurred (St. John and St. Thomas) explains the absence of the skink on those islands today. Black rats also occur throughout the region and may have preyed on this species. Habitat alteration from agriculture and urbanization, another threat to the species, is a continuing problem on these islands and their islets.

Based on IUCN Redlist criteria (IUCN 2011), we assess the conservation status of *Spondylurus spilonotus* as Critically Endangered and possibly extinct (CR A2ace). It faces a primary threat from the introduced mongoose, which has probably led to its extinction. Secondary threats include habitat destruction from agriculture and urbanization, and predation from other introduced mammals, including black rats. Studies are needed to determine if the species still exists, the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be undertaken, if the species still exists.

Reproduction. No data on reproduction are available for this species.

Etymology. Not provided in the original description. However, the species name (*spilonotus*) is a Latinized noun in the nominative singular derived from the Greek nouns *spilos* (spot, stain) and *notos* (the back), referring to the distinctly spotted dorsal pattern of this species. When combined with *Mabuya* (feminine) instead of *Euprepes* or *Spondylurus* (masculine), some authors (Barbour 1914; Cochran 1961; Horton 1973) converted the gender of the species name to feminine, whereas others retained it as masculine. As it is a noun and not an adjective, it retains the original (masculine) spelling, regardless of the gender of the genus.

Remarks. *Spondylurus spilonotus* is another old species name (Wiegmann 1837) that has had a confusing history (Bauer *et al.* 2003). See also the Remarks for *S. semitaeniatus*, another species described by Wiegmann and with a similar history. Until now, the name has generally been considered a synonym of either *Spondylurus sloanii* or *Mabuya mabouya*. *Euprepes spilonotus* was described by Wiegmann (1837) based on two specimens that were included among the material used by Schneider (1801) to describe *Scincus auratus*, a species now going by the name *Trachylepis aurata* (Linnaeus, 1758) and with a new lectotype (Moravec *et al.* 2006). Wiegmann stated—in

Latin—that one of the two specimens (locality not known) came from the collection of "Meyer of Stettin" (*Exemplum Musei Meyeriani Stettinensis*), and the other was "allegedly from the West Indies." The characters mentioned by Wiegmann (1837) have no current diagnostic value—as is typical for almost all of the early named taxa reviewed herein—and therefore the loss of the second specimen meant that no collection locality could be tied with the name or surviving type (ZMB 1240). Nonetheless, our examination of that specimen and characters, through detailed images, indicates that it came from either St. Thomas or St. John (where other, similar, specimens have been collected). Therefore we fix the type-locality as St. Thomas or St. John and designate this specimen as the lectotype.

Wiegmann's (and Schneider's) "Meyer of Stettin" probably was Johann Carl Friedrich Meyer (1739–1811), a student of Linnaeus in college, pharmacist and chemist in his career, and member of "Gesellschaft Naturforschender Freunde zu Berlin" (Friends Natural History Society of Research in Berlin), an organization having close ties with ZMB. Marcus Elieser Bloch (1723–1799), the source of *Euprepes semitaeniatus* (ZMB 1238), was a founding member of that society (Paepke 1999). Thus we suspect that ZMB 1240 had the same origin as ZMB 1238, regardless of whether or not it went through the hands of Johann Meyer. In other words, it probably came from Bloch's source of material shipped from St. Croix to Copenhagen and acquired during 1779–1799. Both specimens were described by Wiegmann (1837) at the same time, have close accession numbers, and trace to the work of Schneider (1801).

During the last two centuries, this species name has had additional confusion. Peters (1864) correctly identified the type as ZMB 1240. Stejneger (1904), however, listed it incorrectly as ZMB 3785; it is unclear whether he actually examined a different specimen or just listed the number incorrectly. Dunn (1936) further altered the holotype accession number by transposing the last two digits, resulting in "ZMB 3758," which was repeated by later authors (Grant 1940; Schwartz & Thomas 1975; Schwartz & Henderson 1988) and recently corrected (Bauer *et al*. 2003). Also, for about a century (1871–1973), *Spondylurus spilonotus* was thought to be the name for the Jamaican Skink (herein called *S. fulgidus* Cope), at least by some authors, and was treated either as endemic to Jamaica or a species with a wider range but also occurring on Jamaica. That error appears to have been started by Peters (1871) and was followed by Stejneger (1904), Barbour (1914), Grant (1940), Murray (1949), Cochran (1961), and Horton (1973). Superficially, *S. fulgidus* and *S. spilonotus* might be confused because they both have a wide middorsal pale (tan) stripe, but otherwise they differ in scalation and other characters. Possibly related to this confusion regarding skinks from Jamaica and the Virgin Islands is a specimen of *S. fulgidus* in the Hamburg collection (ZMH R09298), from 1877, with an incorrect locality: "St. Thomas."

The collector of the two specimens of *S. spilonotus* from St. John, "Professor A. S. Oersted," was almost certainly Professor Anders Sandoe Oersted (1816–1872). He was known to have collected animals in the Danish West Indies between 1845 and May, 1846 (Millspaugh 1902), thus constraining the date of collection of these skinks.

***Spondylurus turksae* sp. nov.**

Turks Islands Skink
(Figs. 73G, 83, 84)

Mabuya sloanii—Barbour, 1916:219 (part).
Mabuya mabouya sloanii—Dunn, 1936:544 (part).
Mabuya mabouya—Barbour, 1937:147 (part).
Mabuya mabouya sloanei—Schwartz & Thomas, 1975:141 (part).
Mabuya mabouya sloanei—MacLean *et al*., 1977:21 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1988:151 (part).
Mabuya mabouya sloanei—Schwartz & Henderson, 1991:457 (part).
Mabuya bistriata—Powell *et al*., 1996:82 (part).
Mabuya sloanii—Miralles, 2005:49 (part).
Mabuya sloanii—Henderson & Powell, 2009:293 (part).

Holotype. KU 242171, an adult female, collected at North Wells (1.6 km N. Cockburn Town), Grand Turk Island, Turks and Caicos, 28 January 1961, by Albert Schwartz. Original field number AS 10906.

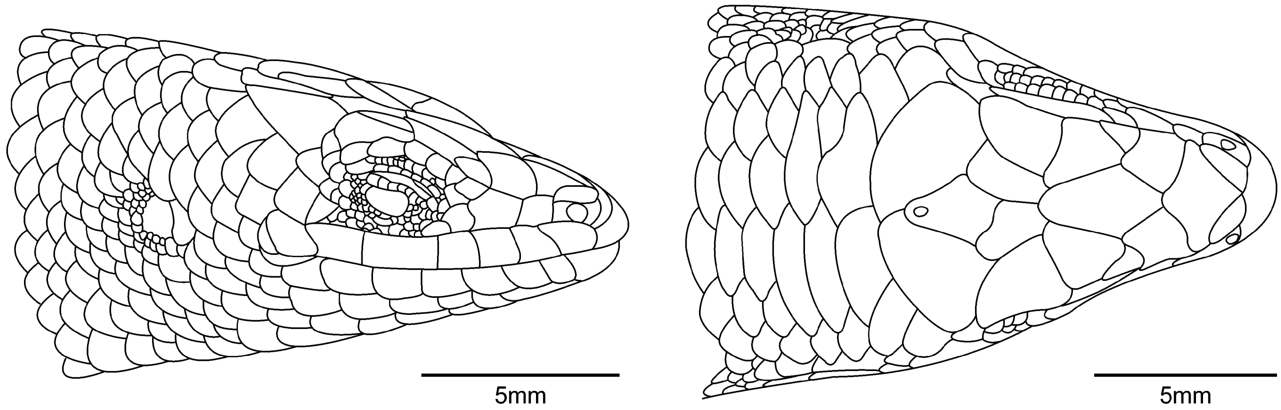

FIGURE 83. Head scalation in species of the Genus *Spondylurus* (left, side view; right, dorsal view). *S. turksae* **sp. nov.** (KU 242171, holotype).

FIGURE 84. *Spondylurus turksae* **sp. nov.**, from the Turks Islands. (A–C) KU 242171, holotype, 1.6 km N Cockburn Town, Grand Turk. (D) KU 242170, paratype, Gibbs Cay.

Paratypes (n = 6). Gibbs Cay. KU 242170, Albert Schwartz, 26 March 1972. Grand Turk Island. ANSP 3835 (no additional collection information available); KU 242172–73, Albert Schwartz, North Wells (1.6 km N. Cockburn Town), 28–30 January 1961; MCZ R-11946–47, L. A. Mowbray, no specific locality, June 1916.

Diagnosis. *Spondylurus turksae* **sp. nov.** is characterized by (1) maximum SVL in males, 79.3 mm; (2) maximum SVL in females, 79.1 mm; (3) snout width, 2.42–3.69% SVL; (4) head length, 15.2–16.5% SVL; (5) head width, 12.0–13.0% SVL; (6) ear length, 1.30–1.81% SVL; (7) toe-IV length, 7.05–8.90% SVL; (8) prefrontals, two; (9) supraoculars, four; (10) supraciliaries, four (86%), five (14%); (11) frontoparietals, two; (12) supralabial below the eye, five (67%), six (33%); (13) nuchal rows, two (86%), three (14%); (14) dorsals, 59–63; (15) ventrals, 59–63; (16) dorsals + ventrals, 119–126; (17) midbody scale rows, 30; (18) finger-IV lamellae, 12–15; (19) toe-IV lamellae, 15–17; (20) finger-IV + toe-IV lamellae, 28–30; (21) supranasal contact, N; (22) prefrontal contact, N; (23) supraocular-1/frontal contact, Y (14%), N (86%); (24) parietal contact, Y; (25) pale middorsal stripe, Y; (26) dark dorsolateral stripe, Y; (27) dark lateral stripe, Y; (28) pale lateral stripe, N (or weak); and (29) palms and soles, pale (Tables 3–5).

Within the Genus *Spondylurus*, *S. turksae* **sp. nov.** differs from *S. anegadae* **sp. nov.**, *S. culebrae* **sp. nov.**, *S. haitiae* **sp. nov.**, *S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. semitaeniatus*, and *S. sloanii* by having a wider middorsal stripe (3.51–4.68% SVL versus 0.953–3.32% SVL in those other species) and a lower dark dorsolateral stripe width/middorsal stripe width ratio (0.187–0.622 versus 0.64–3.79 in those other species; Fig. 79). It differs from *S. macleani*, *S. magnacruzae* **sp. nov.**, *S. martinae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. powelli* **sp. nov.**, *S. sloanii*, and *S. spilonotus* in having fewer midbody scale rows (30 versus 32–34). It differs from *S. fulgidus*, *S. haitiae* **sp. nov.**, and *S. nitidus* in having a shorter toe (toe-IV length 7.05–8.90% SVL versus 9.01–12.9% SVL). It differs from *S. haitiae* **sp. nov.**, *S. martinae* **sp. nov.**, and *S. monitae* **sp. nov.** in having fewer ventral scales (59–63 versus 64–72). It differs from *S. anegadae* **sp. nov.** by lacking supranasal contact (versus supranasals in contact in *S. anegadae* **sp. nov.**). It differs from *S. caicosae* **sp. nov.** in being larger (three of seven *S. turksae* **sp. nov.** > 77.7 mm SVL versus all 99 specimens of *S. caicosae* **sp. nov.** < 77.6 mm SVL) and in having a higher ear (ear height 1.57–1.87% SVL versus 0.73–1.52% SVL), a wider pale dorsolateral stripe (1.98–2.33% SVL versus 1.02–1.73% SVL), and a dark lateral stripe that is irregular and extends to hindlimbs (versus straight-edged and extends only half-way to hindlimbs). It differs from *S. fulgidus* in having more dorsal scales (59–63 versus 52–58). It differs from *S. haitiae* **sp. nov.** in having a longer ear (ear length 1.30–1.81% SVL versus 1.19% SVL) and fewer dorsals + ventrals (119–126 versus 129–131). It differs from *S. lineolatus* in having a wider snout (snout width 2.42–3.69% SVL versus 1.97–2.34% SVL), a longer head (head length 15.2–16.5% SVL versus 12.9–14.4% SVL), a wider head (head width 12.0–13.0% SVL versus 9.58–11.6% SVL), more finger-IV lamellae (12–15 versus 8–11), more finger-IV + toe-IV lamellae (28–30 versus 21–26) and fewer dark stripes (four versus 10). It differs from *S. nitidus* in having a shorter head (head length 15.2–16.5% SVL versus 16.6–20.7% SVL).

Description of holotype (Figs. 83, 84A–C). An adult female in good state of preservation, without injuries and with an abdominal slit. SVL 77.8 mm; tail length 74.0 mm (regenerated); HL 11.8 mm; HW 9.47 mm; SW 2.62 mm; EL 1.21 mm; and toe-IV length 6.09 mm; ear-opening average in size and round; toe length in the following order: I < V < II < III < IV.

Head scalation. Rostral wider than high, contacting first supralabials, nasals and supranasals. Paired supranasals not in median contact, contacting anteriormost loreal. Frontonasal diamond-shaped, wider than long, laterally in contact with anterior loreal scale (on the left side only due to anomalous head scale configuration on the right). A pair of quadrilateral prefrontals, separated medially, and in contact with frontonasal, both anterior (left side only) and posterior loreals, first and second supraoculars, and frontal. Frontal heptagonal, in contact with the second supraoculars and paired frontoparietals. Frontoparietals also in contact with parietals and interparietal. Interparietal tetragonal and lanceolate, separated from nuchals by parietals; parietal eye distinct. Parietals in contact with upper secondary and tertiary temporal scales. Four supraoculars (supraoculars three and four fused on the left), the second one being the longest and largest. Four supraciliaries (supraciliaries two and three fused on the left), the second the longest. Nostril in posterior part of the nasal. A small postnasal, bordered by supranasal, anterior loreal and first supralabial. Anterior and posterior loreals squarish with posteromedial projection on latter. Two upper preoculars and two lower preoculars. Seven supralabials, the fifth being the widest and forming the lower border of the eyelid. Six moderately enlarged scales behind eye comprising the postoculars; similar to temporal scales but smaller. One primary temporal, two secondary temporals, and three tertiary temporals; all imbricate, smooth, cycloid, not distinctly delimited from the scales on the nape and the sides of the neck. Seven infralabials. Mental scale wider than long, posterior margin straight. Postmental scale and one pair of adjoining chin shields in contact with anterior infralabials. First pair of chin shields in contact medially; second pair separated by a smaller cycloid scale.

Body and limb scalation. Two rows of paired nuchal scales and one additional right nuchal scale. Other scales on nape similar to dorsals. On lateral sides of neck, scales slightly smaller. Dorsal scales cycloid, imbricate, smooth, 60 in a longitudinal row; ventrals similar to dorsals; 62 in a longitudinal row; 30 scales around midbody. No distinct boundaries between dorsals, laterals and ventrals. Scales on tail and limbs similar to dorsals, except smaller on limbs. One enlarged dorsal scale row and one enlarged ventral scale row on regenerated tail with rows similar to ventrals on each side. Palmar and plantar regions with small tubercles, subequal in size and delimited by a surrounding region of flatter scales. Subdigital lamellae smooth, single, 14 under finger-IV and 15 under toe-IV. Four preanals larger than adjacent ventral scales. Enlarged median subcaudal scales on tail.

Pattern and coloration. Dorsal ground color medium greenish-brown without dark brown spots. Dark dorsolateral stripes present, narrow (0.69 mm), dark brown, extending from top of head to first third of body. Dark lateral stripes present, dark brown, extending from loreal region to last third of body and breaking into a series of spots around midbody. Pale middorsal stripe present, wide (3.36 mm), medium greenish-brown, extending from top of head to first third of body. Pale dorsolateral stripes present, pale gray, extending from behind eye to first third of body. Pale lateral stripes absent. Ventral surface of body without pattern. Palmar and plantar surfaces unpigmented. No information on color in life of the holotype.

Variation. In coloration and scalation, the other specimens closely resembled the holotype (Tables 4–5). The forelimbs were mottled with dark brown and hindlimbs had small dark brown spots. The tails of all specimens were pale (orangeish in preservative) distally.

Distribution. This species is distributed on Grand Turk Island (18 km^2) and the adjacent islets of Cotton Cay (see below) and Gibbs Cay (Fig. 9C).

Ecology and conservation. No information on the ecology or behavior of this species is available. Grand Turk is a small island that is heavily developed, supporting a relatively large human population (3,720). Most of the island is urbanized, and some large areas are comprised of saline ponds and treeless open areas. Little forest remains, and rats are present on the island. As early as 1916 skinks were reported as being "very rare" on Grand Turk (Barbour 1916). The last record of this species on Grand Turk was in 1961, and one individual was found on Gibbs Cay, a small islet to the SE of Grand Turk, in 1972. One of us (SBH) was unable to locate the species on Grand Turk during a visit in August, 1999, although the species may still exist on Gibbs Cay. Skinks, probably belonging to this species based on distribution, were observed recently on another islet of Grand Turk, Cotton Cay (R. Graham Reynolds, personal communication). If so, and considering the apparent extirpation of *Spondylurus turksae* **sp. nov.** from Grand Turk, these skinks on the small cays of the Turks Bank are the only surviving populations of the species and should be protected.

Based on IUCN Redlist criteria (IUCN 2011), we consider the conservation status of *Spondylurus turksae* **sp. nov.** as Critically Endangered (CR A2ace). It faces a primary threat from habitat alteration by urbanization on Grand Turk Island, and possible development and habitat disturbance on the small cays of Turks Bank where it occurs. The other major threat is predation by introduced mammals, including black rats, in all of these areas. Studies are needed to determine the health of any remaining populations, and threats to the survival of the species. Captive breeding programs should be considered.

Reproduction. No data on reproduction are available for this species.

Etymology. The species name (*turksae*) is a feminine genitive singular noun referring to the distribution of the species in the Turks Islands.

Remarks. The uniqueness of the skinks from the Turks and Caicos Islands has been hinted in earlier work. For example, Barbour (1916) commented on the collection of the two MCZ specimens from Grand Turk and how they differed from typical *Spondylurus sloanii* in lacking supranasal contact. All other *S. turksae* **sp. nov.** that we examined also lack supranasal contact, and that character separates it from a few of the many taxa formerly recognized as *S. sloanii*. Mayer and Lazell (2000) also noted some pattern differences between skinks of the Turks and Caicos and those of the Puerto Rico region. Conversely, biogeographic connections between the Turks and Caicos fauna and that of the Puerto Rico region have been noted as well (Thomas & Hedges 2007) and are consistent with the direction of water currents which would have carried animals on flotsam (Hedges 1996b). *Spondylurus turksae* **sp. nov.** has a larger body size and narrower dorsolateral stripes than *S. caicosae* **sp. nov.**, and the dark lateral stripes extend to the hindlimbs. In these ways it resembles *S. nitidus* more than *S. caicosae* **sp. nov.** Nonetheless, both species are small (maximum SVL, 78–79 mm) compared to others in the genus, including *S. nitidus* (96 mm SVL), have proportionately short heads (average head lengths 15.9–16.3% SVL, versus 18.3%

SVL in *S. nitidus*), and low numbers of midbody scale rows (rarely > 30), suggesting a close relationship. Note added in proof: our DNA sequence analyses indicate a separate origin for *S. turksae* from the Puerto Rican Bank.

Genus *Varzea* gen. nov.

Amazonian Floodplain Skinks

Type species. *Mabuya bistriata* Spix, 1825:23.

Diagnosis. Species in this genus are characterized by (1) frontoparietals, two, (2) supraciliaries, 4–5, (3) supraoculars, four, (4) prefrontal contact, absent or (less commonly) present, (5) parietal contact, present, (6) rows of nuchals, one, (7) dorsals + ventrals, 116–126, (8) total lamellae, 208, (9) a dark middorsal stripe, absent, (10) dark dorsolateral stripes, absent (except, occasionally, as rows of broken spots), (11) dark lateral stripes, present, and (12) dark ventral striping, absent. They reach 97 mm SVL (Table 2).

Species of *Varzea* are not especially distinctive among mabuyines, having the normal dark lateral stripes and most of the basic head scale conditions shared with other genera. *Varzea* differs from *Aspronema*, *Brasiliscincus*, *Capitellum*, *Manciola*, and *Psychosaura* in having more total digital lamellae (208 versus 147–201). The presence of a single nuchal row separates this genus from *Exila* and *Panopa* (2–5 nuchal rows) and from most *Spondylurus* (usually 2–3 rows, rarely one). The presence of two frontoparietals (unfused) separates this genus from *Exila*, *Notomabuya*, and *Panopa* (one frontoparietal). The absence of a middorsal dark stripe further distinguishes this genus from *Aspronema* and *Manciola*. Contact of the parietal scales distinguishes this genus from the Genus *Copeoglossum* (parietals rarely in contact). In having four supraoculars, *Varzea* is separated from two genera with three supraoculars: *Aspronema* (rarely four) and *Mabuya* (rarely two or four). From *Manciola* (136–141 dorsals + ventrals) and *Maracaiba* (127 dorsals + ventrals), it differs by having fewer dorsals + ventrals (116–126). The presence of dark dorsolateral stripes, albeit narrow, short, and sometimes absent in *V. altamazonica*, separates *Varzea* from *Alinea*, *Capitellum*, *Copeoglossum*, *Exila*, *Mabuya* (rarely present), *Maracaiba*, *Marisora* (rarely present), and *Notomabuya*. *Varzea* differs from *Psychosaura* in having a typical mabuyine head shape (subacuminate) versus a prominent, acuminate head shape in *Psychosaura*.

Content. Two species are placed in this genus: *Varzea altamazonica* and *V. bistriata* (Table 1).

Distribution. This genus is distributed throughout the Amazonian basin of South America, including Bolivia, Brazil, French Guiana, and Peru, and likely to occur in Ecuador (Fig. 8B; Miralles 2006b; Harvey *et al.* 2008).

Etymology. The generic name (*Varzea*) is a feminine noun, from the Portugese várzea (a pre-Roman word, Iberian in origin) meaning "flooded river bank," in allusion to the apparent preferred habitat of these species.

Remarks. The two included species in this genus cluster as closest relatives in the current molecular phylogeny (Fig. 5) and in past phylogenetic analyses (Whiting *et al.* 2006, with sequences labeled differently; Miralles & Carranza 2010). However, nodal support has never been significant, probably because they diverged shortly after their shared lineage split from other clades of mabuyines. Nonetheless, the two species occur in similar floodplain (Varzea) habitats (Avila-Pires 1995) and replace each other geographically, with *Varzea altamazonica* being the upland, western species and *V. bistriata* being the more lowland, eastern species. Miralles and Carranza (2011) considered them to be closest relatives and referred to them as the "Riparian" Clade.

Discussion

Phylogenetic relationships

Of the 61 species of Mabuyinae (Table 1), 27 species in six genera are not included in the molecular analyses. Of those missing species, most (17 species) are possibly extinct. Only one generic clade in the molecular phylogeny (Fig. 5), *Varzea*, had weak ML and Bayesian support. All others had significant, or near-significant (*Notomabuya*), nodal support from at least one of the two analyses, with most having significant support from both analyses. We have diagnosed all of the 16 genera, morphologically, although a comprehensive revision of the mainland material is needed.

Genera and large clades. Overall, the tree is ladder-like (pectinate) rather than balanced, forming successively nested groups of genera. Additional gene and morphological data will be needed to achieve full resolution of mabuyine phylogeny. Nonetheless, two clades of multiple genera can be defined.

There is a Northern Clade of four genera (*Mabuya*, *Maracaiba*, *Marisora*, and *Orosaura*) with moderate support (Fig. 5). We suspect that *Alinea* is most closely related to *Mabuya* and therefore place it in this clade as well, based on its high total lamellae counts, parietal contact, and absence of dark middorsal and dorsolateral stripes. Species of the Northern Clade have parietal contact and usually lack dorsal striping (i.e., dark middorsal and dorsolateral stripes). The clade occurs in Middle America, northern South America, and on Caribbean islands. It corresponds mostly to what Miralles *et al.* (2009b) called their "Caribbean Clade," but we choose not to use that name because there is a large and unrelated clade (*Spondylurus*) with even more species on Caribbean islands, and there are other, unrelated, clades of species (*Capitellum*, *Copeoglossum*) that invaded Caribbean islands. Also, some of the included species of *Marisora* are not "Caribbean" in that they occur on the Pacific versant of Central America and Mexico and in the Andes of northern South America. A more inclusive "core clade" of mabuyines (29 species) could be defined by adding the genera *Aspronema*, *Varzea*, *Manciola*, and *Psychosaura* to the Northern Clade, as indicated in the molecular phylogeny (Fig. 5). However, support values for such a clade are low, and morphological characters supporting it are not obvious. We consider *Capitellum* (all three species are probably extinct) to be most closely related to *Brasiliscincus* (three sp.) based on head size (small), body shape (not dorsoventrally compressed), and a relatively low number of digital lamellae. Together, they form a Small-headed Clade (six named species and others unnamed). *Manciola* shares a low number of digital lamellae with *Brasiliscincus* and *Capitellum*, and shares pattern similarities with *Brasiliscincus*, and therefore may be a member of this Small-headed clade as well, but the molecular phylogeny does not resolve its position.

The bulk of species diversity in Mabuyinae is in the Northern Clade (22 named species and others unnamed) and in the genera *Copeoglossum* (five named species and at least nine unnamed) and *Spondylurus* (17 species). *Copeoglossum* is essentially an Amazonian Clade of large species that usually lack parietal contact and dorsolateral stripes and have dark palms and soles (except *C. arajara*). *Spondylurus* is a Greater Antillean Clade of species that usually have parietal contact and dorsolateral stripes, and most (14 of 17) species have pale palms and soles. Together, these four clades (Small-headed, Northern, Amazonian, and Greater Antillean) comprise 50 of the 61 named species of mabuyine skinks.

As in previous analyses (Miralles & Carranza 2010) we find the species comprising *Panopa* to be the earliest branching clade. Above that clade we find *Notomabuya* as the next most basal branch, in a different position than was found by Miralles and Carranza (2010), but neither result is strongly supported. Nonetheless, the positions of *Panopa* and *Notomabuya* in Fig. 5 suggest that the frontoparietal state might be diagnostic. Those two clades have a single frontoparietal whereas all other species (except *Aspronema cochabambae* and *Exila nigropalmata*) have two frontoparietals. *Aspronema cochabambae* is nested up in the tree (Fig. 5) as closest relative of *A. dorsivittatum* (two frontoparietals), and therefore its single frontoparietal is derived. *Exila nigropalmata* has a long branch (Fig. 5), and its phylogenetic position has been difficult to determine (Miralles & Carranza 2010). Possession of a single frontoparietal may suggest that it belongs at the base of the tree, before the gain of two frontoparietals. Additional sequence evidence is needed to clarify these questions.

Species groups. Species groups can be defined in some of the genera. In *Alinea*, two such groups are evident. Species of the *lanceolata* Group (*A. lanceolata*, *A. luciae*) occur in the Lesser Antilles and share ventral striping and a similar body shape (mid-body bulge). Species of the *pergravis* Group (*A. berengerae*, *A. pergravis*) occur on islands in the western Caribbean, off Nicaragua, and have an attenuate body shape. Species groups within *Copeoglossum* await a revision of that genus, but molecular phylogenies define at least nine undescribed species in South America (see Remarks for the genus). Within *Mabuya*, the species inhabiting Guadeloupe (*guadeloupae* Group) and its islets share characters, as noted in the account for that genus. Within *Marisora*, there are two well-supported geographic clades (Fig. 5): species in Middle America and adjacent islands (*unimarginata* Group; including *M. alliacea*, *M. brachypoda*, *M. magnacornae* **sp. nov.**, *M. roatanae* **sp. nov.**, and *M. unimarginata*) and those in South America and adjacent islands (*falconensis* Group; including *M. aurulae* **sp. nov.** and *M. falconensis*). Species of the *unimarginata* Group usually have well defined dark and pale lateral stripes but these are poorly defined in the *falconensis* Group. The earliest species to be described, *M. unimarginata*, is the one that is most difficult to place, in part because no sequence data are available, but also because it shares characters with both groups (see Remarks for *Marisora*). We place it with the other Middle American species based on that pattern character, but molecular evidence is needed to test that arrangement.

We place species of the Genus *Spondylurus* in seven species groups based on the molecular phylogeny and morphological evidence. There is a pair of large species in the U.S. Virgin Islands, the *spilonotus* Group, that includes *S. magnacruzae* **sp. nov.** and *S. spilonotus*. Besides large body size (maximum SVL of each, 107 mm) they have a similar pattern of wide middorsal stripes and narrow dorsolateral stripes, high total lamellae counts, and a high and uniform midbody scale row count of 34. The *semitaeniatus* Group includes two species in the Virgin Islands: *S. anegadae* **sp. nov.** and *S. semitaeniatus*. They are smaller species (maximum SVL, 70–83 mm), and their pale middorsal stripes, as adults, are usually as pale as their dorsolateral stripes. Also they have the highest frequency of supranasal contact in the genus (Table 4), approached only by *S. sloanii*, and the highest ratio of dark dorsolateral stripe width to middorsal stripe width in the genus (Table 5). The *martinae* Group includes two species on the Anguilla Bank (*S. martinae* **sp. nov.** and *S. powelli* **sp. nov.**) that share a similar pattern of narrow dark dorsolateral stripes and wide pale middorsal stripe, with the top of the snout defined by dark and pale edges (although the latter trait is not unique). The *caicosae* Group includes one species in the Turks and Caicos Islands (*S. caicosae* **sp. nov.**) that has a small body size (maximum SVL, 78 mm) and short lateral dark stripes, with paler (included) spots, that end in vertical bars. Most of the remaining species are placed here in the *sloanii* Group, which is centered in the greater Puerto Rico region and is composed of *S. culebrae* **sp. nov.**, *S. macleani, S. monae* **sp. nov.**, *S. monitae* **sp. nov.**, *S. nitidus*, and *S. sloanii*, together with species from Hispaniola (*S. haitiae* **sp. nov.**) and the Turks Islands (*S. turksae* **sp. nov.**). Their pale middorsal stripes tend to be darker than their pale dorsolateral stripes (except *S. macleani*), and they are moderate to large species (maximum SVL, 79–98 mm SVL). This group includes three species with the longest heads in the genus (after *S. fulgidus*): *S. culebrae* **sp. nov.**, *S. monae* **sp. nov.**, and *S. nitidus* (average head lengths 17.6–18.3% SVL). All of the representatives of the *sloanii* Group present in the molecular phylogeny (*S. culebrae* **sp. nov.**, *S. macleani, S. monitae* **sp. nov.**, and *S. sloanii*) form a single, well-supported, group (Fig. 5). The remaining two species in the genus are divergent in the molecular phylogeny and morphologically, and they are assigned to monotypic groups: the *fulgidus* Group (*S. fulgidus*) and *lineolatus* Group (*S. lineolatus*). *Spondylurus fulgidus* has a relatively long head (average head length, 18.9% SVL) and a high number of total lamellae (238), consistent with its scansorial habits. In contrast, *Spondylurus lineolatus* has the shortest head (average head length, 13.3% SVL) and smallest number of total lamellae (159).

Evolution and biogeography

There was early speculation that the Neotropical skink lineage (Mabuyinae) originated in Africa (Dunn 1936; Greer 1970b), and molecular evidence later suggested that it reached the Americas by overwater dispersal in the late Cenozoic (Carranza & Arnold 2003). At least one other dispersal event of African skink lineages occurred, leading to *Trachylepis atlantica*, a species on Fernando de Noronha off eastern Brazil (Mausfeld *et al.* 2002; Mausfeld & Vrcibradic 2002; Carranza & Arnold 2003). The direction of dispersal in both cases (east to west) is supported by the nesting of those lineages among Old World lineages (Carranza & Arnold 2003; Skinner *et al.* 2011). South America was relatively isolated at that time, without continuous land connections to neighboring continents. Dispersal would have been facilitated by the Coriolis Effect, which favors east to west flow of ocean currents.

Carranza and Arnold (2003) estimated the time of the mabuyine dispersal event to be 9–7 Ma based on a uniform rate of sequence divergence (12S rRNA and cyt b) derived from Canary Island lizards. Miralles and Carranza (2010), in a more recent study using those same two genes, derived rate estimates from other groups of lizards and applied them to mabuyines with a linearized tree method. The time of the dispersal event was not estimated in that study, but some dated nodes within the mabuyine radiation were older than 9 Ma (Miralles & Carranza 2010). We used Bayesian methods—random rate and autocorrelated rate models—and internal calibrations to estimate a timetree of Mabuyinae (Fig. 7). Our estimate of the dispersal event from Africa is 17.7 Ma (24.9–9.35 Ma), which places it in the Early Miocene. At that time, Africa and South America were 18% closer, and therefore the distance travelled would have been a minimum of 2500 km (82% of the current distance of 3000 km) and would have taken at least two months based on rates of ocean current flow (Guppy 1917).

Within the mabuyine radiation (Fig. 7), the 14 included genera diverged from their closest relatives approximately 9.6 (13.8–6.5) Ma, and the earliest divergence within a genus, having more than one species, was

6.5 (10.4–2.6) Ma. Therefore, all of the genera arose in the Miocene and typically had begun diversification before the close of the Miocene. In a recent molecular clock analysis of Old World skinks, 24 of 35 genera also were found to have diverged from their closest relatives in the Miocene (Skinner *et al.* 2011), illustrating some temporal consistency among classifications. Thus, divergence of the major clades and genera of mabuyine skinks occurred during the Late Miocene, 13.8–6.5 Ma. That timeframe is similar to a previous estimate using different methods (Miralles & Carranza 2010).

At the species level, the phylogenetic tree (Fig. 5) and timetree (Fig. 7) show that Central and South American populations of mabuyines are in need of taxonomic revision. For example *Marisora brachypoda* and *Copeoglossum nigropunctatum* are both paraphyletic, and *Brasiliscincus agilis* and *B. heathi* are paraphyletic or polyphyletic. These taxonomic problems have been raised previously (Vrcibradic *et al.* 2006; Miralles & Carranza 2010) and have been discussed above. Three pairs of closely related species (one pair being sympatric; *Psychosaura agmosticha* and *P. macrorhyncha*) in South America show divergences in the Pliocene, 3.9–2.6 Ma. On Caribbean islands, where this revision has clarified species boundaries, divergences among the most closely related species were in the late Pleistocene. For example, several species of *Spondylurus* (*S. culebrae* **sp. nov.**, *S. macleani*, *S. monitae* **sp. nov.**, and *S. sloanii*) in the greater Puerto Rico region diverged 0.66–0.42 Ma, and two species pairs of *Marisora* show similar divergence times: *M. aurulae* **sp. nov.** and *M. falconensis* (0.46 Ma), and *M. roatanae* **sp. nov.** and *M. brachypoda* (0.58 Ma). All of these species are allopatric. Most sympatric species on Caribbean islands are either in different genera or possibly extinct (and thus unsampled by molecular data here). One sympatric pair of *Spondylurus*, *S. semitaeniatus* and *S. sloanii*, diverged in the early Pleistocene (2.3 Ma) and are not closest relatives. Error bars (Fig. 7) are large and should be considered when drawing conclusions from these time estimates. Nonetheless, it would appear that Pleistocene climatic events, including sea level changes, had a major effect on speciation in mabuyine skinks of Caribbean islands.

The timetree (Fig. 7), and morphological evidence, show that the six genera of Caribbean island skinks arose from six independent dispersal events from South America. Five of those dispersals occurred in the late Miocene (Fig. 85A), and all would have involved at least some crossing of open ocean water, while floating on mats of vegetation, flotsam (Fig. 86). Ocean currents flow northwest along the northeast coast of South America carrying flotsam into the Caribbean. Once in the Caribbean, water currents are almost unidirectional, carrying flotsam westward and then looping up to the Gulf Stream. A similar current flow would have occurred prior to the closing of the Isthmus of Panama (Hedges 1996a, 1996b; Hedges 2001). Not all distributions on the islands can be explained by unidirectional current flow, and therefore other mechanisms or current directions must have occurred in the past (Hedges 2001; Hedges 2006b). Dispersal times to and among the Caribbean islands, based on current flows and observations (Guppy 1917; Censky *et al.* 1998), would have taken weeks, on average, or 1–3 months if the flotsam originated from the Amazon.

One of the earliest successful Miocene dispersal events was to the northern Antilles (*Spondylurus*) and it is constrained, temporally, by the split of that lineage from *Exila* (9.9 Ma) and the earliest divergence within *Spondylurus* (8.2 Ma). Riparian species, like those in *Varzea*, are the most likely to be washed out to sea after a storm and carried on flotsam. Thus the origin of *Spondylurus* may have occurred in this way, although additional molecular data will be needed to determine, significantly, the closest relative of *Spondylurus*. There are too many missing species of *Spondylurus* in the timetree, because of possible extinctions, to draw any conclusions about details of dispersal within the genus and among islands. Most evolution in *Spondylurus* appears to have been limited to the Greater Antilles and adjacent areas (Turks and Caicos, Anguilla Bank). Surprisingly, *S. lineolatus*, which is one of the most distinctive species of mabuyine skinks from the standpoint of morphology, is nested among populations that were considered a single species (*S. sloanii*) until this revision.

Another Miocene dispersal event (*Marisora*) was from South to Central America. It is constrained by the divergence of Central and South American *Marisora* (6.8 Ma), and the earliest divergence within Central American *Marisora* (5.2 Ma). *Mabuya* probably also dispersed in the Late Miocene from South America to the Lesser Antilles (likely Martinique, the southernmost island of its distribution; Fig. 8). With only one species sampled, the only constraint is that it occurred after the divergence of *Mabuya* and *Maracaiba*/*Orosaura* (7.4 Ma). If it is assumed that *Capitellum* is most closely related to *Brasiliscincus*, the dispersal of *Capitellum* from South America to the Lesser Antilles (likely Martinique, the southernmost island of its distribution; Fig. 8) is constrained by the origin of *Brasiliscincus* (10.9 Ma) and earliest divergence within *Capitellum* (unknown). Finally, we assume that the distinctive Genus *Alinea* also dispersed in the Late Miocene, probably first to Barbados based on current flow.

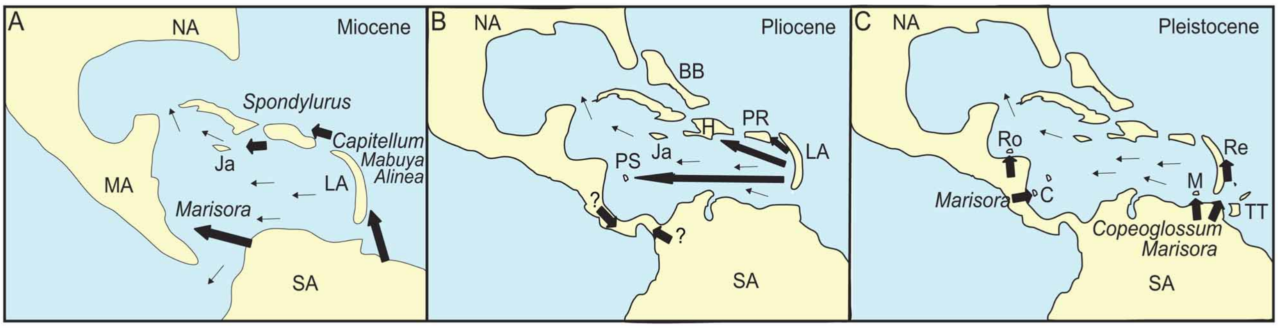

FIGURE 85. Biogeographic model showing the origin of the Middle American and Caribbean clades of Neotropical skinks, Subfamily Mabuyinae. Location of exposed land is conjectural and diagrammatic, and based on a synthesis of models (Pindell 1994; Iturralde-Vinent & MacPhee 1999; Pindell & Kennan 2002). (A) Late Miocene (15–5.3 Ma), when separate dispersals from South America led to five of the six genera currently inhabiting Caribbean islands. (B) Pliocene (5.3–2.6 Ma), presumably when additional dispersals occurred among islands as some of the genera began diversification. Colonization of the newly arisen Isthmus of Panama by *Marisora* occurred either from the south (Colombia) or north (Costa Rica). (C) Pleistocene (2.6–0.01 Ma), when additional dispersals from the mainland led to endemic island species of the genera *Copeoglossum* (Margarita, Windward Islands, and secondarily to Redonda) and *Marisora* (Roatán, Corn Island, and Windward Islands). Dispersal and speciation among islands (*Capitellum*, *Mabuya*, and *Spondylurus*) also occurred at this time. Landmasses are abbreviated as follows: Bahamas Bank (BB), Corn Island (C), Hispaniola (H), Jamaica (Ja), Lesser Antilles (LA), Margarita (M), Middle America (MA), North America (NA), Providencia-San Andres (PS), Puerto Rico (PR), Redonda (Re), Roatán (Ro), South America (SA), and Trinidad and Tobago (TT). Dispersal events (large arrows) and ocean currents (small arrows) are indicated.

FIGURE 86. A rare sighting of flotsam in the Caribbean Sea, 15 kilometers off the north coast of Colombia, north of Barranquilla, probably originating from the Magdalena River. The dimensions were not recorded but it was likely 5–10 m in length based on the size of the swells. Photo taken on 1 June 1999 during the Starship Millennium Voyage scientific exploration, courtesy of Michael Poliza.

Dispersal events during the Pliocene (Fig. 85B; 5.3–2.6 Ma) were limited to movement among islands (Fig. 7). Also, the major land connection (Isthmus of Panama) joining North and South America arose during this period, at approximately 3 Ma (Coates *et al*. 1992). However, without sequence evidence from *Marisora unimarginata* (which occurs in Panama) and more study of Colombian populations, it is not yet clear whether Panama was colonized from the south (Colombia) or north (Costa Rica). The Pliocene may have been the time when dispersal of *Alinea* occurred from the Lesser Antilles to the western Caribbean (San Andres and Providencia).

The sixth genus on Caribbean islands, *Copeoglossum*, probably dispersed from South America to Caribbean islands during the Pleistocene (Fig 85C; 2.6–0.01 Ma). Some islands colonized by this genus (Grenada, Grenadines, Margarita, and Redonda) were reached over water, while others (Trinidad and Tobago) may have been reached over land during glacial low stands. Redonda (*C. redondae* **sp. nov.**) probably was colonized by a secondary dispersal from the Windward Islands, although an independent dispersal from eastern South America is possible as well, considering ocean currents (Hedges 1996b). The timetree (Fig. 7) indicates that the Pleistocene was a time of speciation in the Caribbean island skink fauna, at least with respect to *Spondylurus* in the greater Puerto Rico region. The origin of *Marisora roatanae* **sp. nov.**, and probably *M. magnacornae* **sp. nov.**, also occurred during this time. The fact that the Pleistocene was a time of great sea level change and repeated isolation suggests a cause and effect.

The absence of skinks in Cuba is unexpected, given their otherwise wide distribution throughout the Caribbean region. One possible explanation involves paleogeography. Cuba was connected with Hispaniola and Puerto Rico in the late Eocene and Oligocene (Iturralde-Vinent & MacPhee 1999), which would have facilitated dispersal among the Greater Antilles until ~23 Ma. However, the dispersal of skinks to the Caribbean islands occurred later, during the last 10 million years, and the northern position of Cuba would have made it the farthest island target for flotsam dispersal from South America. Another possible explanation involves human-caused extinction. The Small Indian Mongoose was introduced to Cuba in 1886 (Nellis & Everard 1983) and may have eradicated the skink. This explanation might seem unlikely given the long history of herpetology on the island, without any report of a skink. However, Hispaniola also has had a long history, yet only one specimen of *Spondylurus haitiae* **sp. nov.** was ever collected and placed in a museum, and only three specimens of *Mabuya hispaniolae* **sp. nov.** have been collected. The third species, *S. lineolatus* was only discovered in 1930. All may be extinct now. There are no early literature accounts of those three Hispaniolan species, and the close resemblance of skinks and diploglossids would require a specimen or detailed observations for corroboration. Therefore, skinks may have been endemic to Cuba—and may still exist in remote locations, although unlikely—despite the absence of any literature account or museum specimen.

To summarize, the diverse and complex skink fauna of the Caribbean islands, numbering at least 38 endemic species in six genera, evolved over the last 10 million years by repeated dispersals over ocean waters from South America as well as dispersals among islands. The large proportion of species (25 species = 66%) that are currently unsampled with molecular methods, most of which (17 species = 45%) because they are possibly extinct, limits additional inferences. The application of ancient DNA methods to old museum specimens of those unsampled species in the future may reveal additional insights into the biogeographic history of the Caribbean skink fauna.

Ecology and behavior

By the time that quantitative ecology became popular in the latter half of the 20th century, the Caribbean island skink fauna had already been severely decimated by the mongoose (as documented here), not to mention that it was taxonomically uninteresting in being comprised mostly of a single widespread species. Hence, Caribbean island skinks have been poorly studied, ecologically. Even on the island of Dominica, where skinks have been more abundant than elsewhere, the ecological studies that included skinks found them to be uncommon, and their conclusions were limited by low sample sizes (Brooks 1968; Somma & Brooks 1976; Bullock & Evans 1990). Through these few studies and anecdotal accounts, Caribbean island skinks appear to be diurnal active foragers, primarily (but not exclusively) of dry coastal woodlands. They frequently climb on bushes, cacti, trees and rocks, and appear to be omnivorous, including plant material in their diets (Malhotra & Thorpe 1999; Platenberg & Boulon 2006; Daudin & de Silva 2007; Henderson & Powell 2009). They often retreat to burrows and under rocks when inactive (Bullock & Evans 1990). More ecological studies are sorely needed for Caribbean island skinks, especially for species other than *Mabuya dominicana*.

Ecological studies on South American skinks have revealed that most of those species, like the Caribbean species studied, are omnivores and opportunistic, sometimes taking plant material (Vitt & Blackburn 1991; Vrcibradic & Rocha 1996; Vrcibradic & Rocha 1998; Rocha & Vrcibradic 2004; Vrcibradic *et al.* 2004). Not surprisingly, some species-specific differences are evident. For example, while *Psychosaura macrorhyncha* and *Varzea bistriata* both show a preference for arboreal foraging sites, *Brasiliscincus agilis* is more terrestrial in its preferences (Avila-Pires 1995; Vrcibradic & Rocha 1996, 2002a,b). The differences in behavior agree with structural differences: *P. macrorhyncha* has longer limbs and digits and a flatter body than *B. agilis* (Vrcibradic & Rocha 1996).

Likewise, there are morphological differences among Caribbean island skinks species that probably reflect behavioral differences, as we have speculated above in species accounts. For example, *Alinea pergravis*, known to be a good climber, has an attenuate body, long digits, and long claws. The Jamaican skink, *Spondylurus fulgidus*, also is known to be a good climber on trees and rocks and has similar traits. On the other hand, members of the Genus *Capitellum* have small heads, limbs, and digits, and resemble *Brasiliscincus agilis* in that regard. Nothing is known of their behavior, but they were likely ground-dwelling or cryptozoic, as in *Brasiliscincus*. The similar body form of *Spondylurus lineolatus* would suggest that it, too, is ground-dwelling or cryptozoic. The two larger members of the Genus *Alinea*, *A. luciae* and *A. lanceolata*, have unusual body shapes in showing a midbody bulge. Also, while they have high digital lamellae counts, their limbs (especially in *A. lanceolata*) are not as robust as in the other climbing species. The only habitat note associated with either one was that *A. lanceolata* was collected in a swamp. Thus, their ecological niche is unclear.

Adaptive radiation and convergence are common in other groups of amphibians and reptiles on Caribbean islands. Convergent species are sometimes placed in ecomorphs, which are named based on their perch or habitat type (e.g., bush anole, cave frog). The degree to which ecomorphs correspond to discrete niches in nature, or artificially divide up otherwise continuous ecological space, is unclear. Either way, it is a practical concept for describing differences among species. Groups with described ecomorphs include the large radiations of anoline lizards (Rand 1969; Williams 1972; Losos 2009), sphaerodactylid lizards (Thomas *et al.* 1992; Hedges & Thomas 2001), and eleutherodactylid frogs (Hedges 1989; Hedges *et al.* 2008). In the case of Caribbean island skinks, the paucity of knowledge of their ecological habits makes it difficult to define ecomorphs other than perhaps three broad categories: terrestrial (activity on and near ground level, includes most species), scansorial (vertical climbing of rocks and trees; *Alinea pergravis* and possibly other species of *Alinea*, *Spondylurus caicosae* **sp. nov.**, and *S. fulgidus*), and cryptozoic (in hidden locations on and under the ground; the three species of *Capitellum*, and possibly *Spondylurus lineolatus*). Mainland examples of scansorial species include those in *Panopa* and *Psychosaura* whereas mainland cryptozoic species include those in *Brasiliscincus* (although *Brasiliscincus* would also be considered terrestrial). We have avoided using the term semi-fossorial because it is interpreted by some to mean that burrows are constructed and by others to mean only that burrows or holes in the ground are occupied (e.g., cryptozoic). It is not known whether any species considered here routinely constructs burrows; those in *Capitellum* may have done so.

Species of Caribbean island skinks span a wide range in body size, from only 2–4 grams (*Alinea berengerae*, *Spondylurus lineolatus*) to 31 grams (*Copeoglossum margaritae* **sp. nov.**). Even skinks that until now were placed in the same species—*S. anegadae* **sp. nov.** (6 g) and *S. culebrae* **sp. nov.** (16 g)—differ greatly (Fig. 2). Two or three species coexist sympatrically on several islands in the Greater and Lesser Antilles (Fig. 87), and body size differences are evident in most of those cases (Fig. 88). Such size differences in sympatric anoline lizards have been studied and are thought to be examples of character displacement, which reduces competition among species (Schoener 1970; Losos 2009). Evidence for character displacement is seen when size on sympatric islands is different (more extreme) than on single-species islands. It is more difficult to test that hypothesis in Caribbean island skinks because few occur on more than one island, and they are much less abundant than anoles. In four of the seven cases, species from different genera are involved (Fig. 88), probably already having evolved different body sizes and ecological strategies elsewhere, thus facilitating their colonization and coexistence.

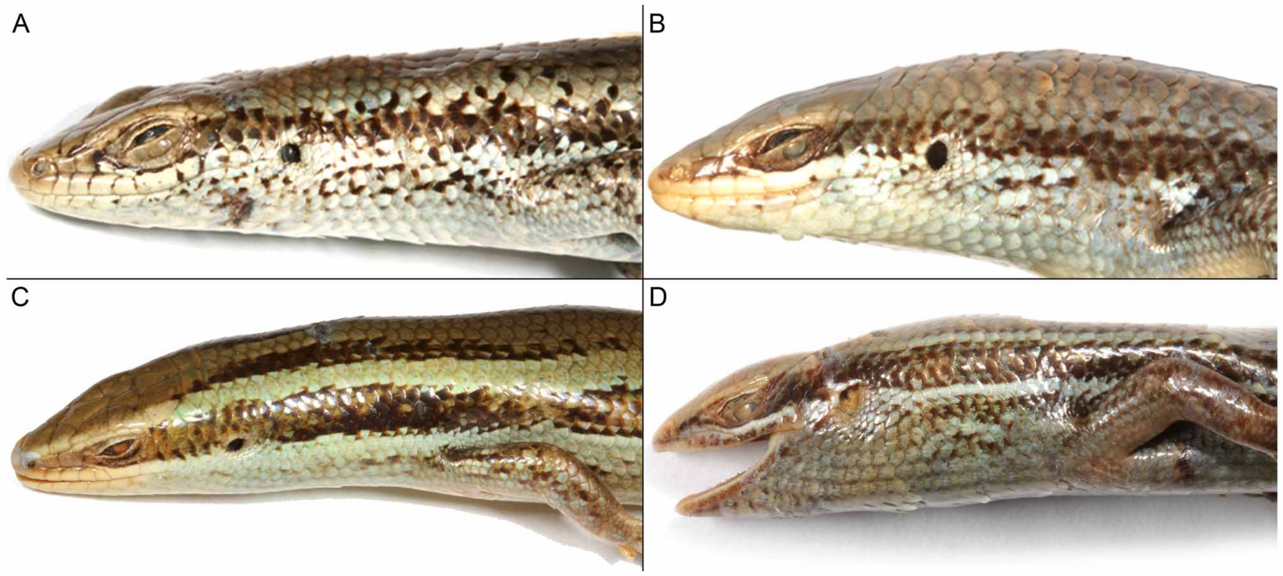

FIGURE 87. Sympatric pairs of Caribbean skinks from two islands. Carriacou Island, Grenadines (Grenada): (A) *Copeoglossum aurae* **sp. nov.**, 109 mm maximum SVL (MCZ R-79097); (B) *Marisora aurulae* **sp. nov.**, 89 mm maximum SVL (MCZ R-79098). St. Croix, U.S. Virgin Islands: (C) *Spondylurus magnacruzae* **sp. nov.**, 107 mm maximum SVL (ZMUC-R 100); and (D) *Capitellum parvicruzae* **sp. nov.**, 68 mm maximum SVL (ZMUC-R 99).

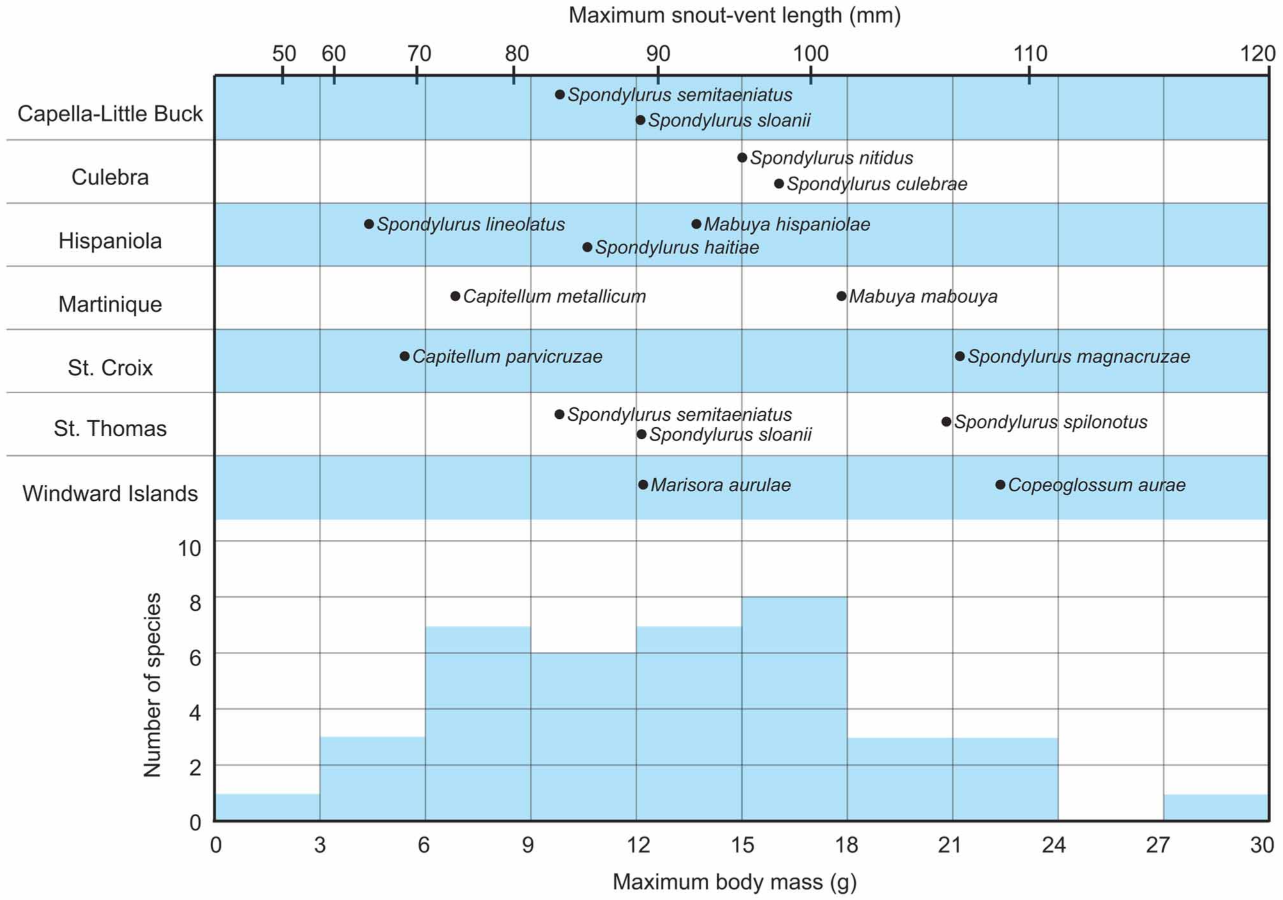

FIGURE 88. Sympatric species of skinks on Caribbean islands and their body size differences in maximum SVL (mm) and maximum body mass (grams). Histogram at bottom includes all 39 species on Caribbean islands (38 endemic and one non-endemic species). Windward islands are grouped because they include the same two species, and are: St. Vincent, the Grenadines, Grenada, Trinidad, and Tobago.

Reproduction

The number of fetuses (1–7) of 77 pregnant females from 18 species of Caribbean island skinks was recorded (75 from specimens examined by us and two from the literature). Most had what are referred to as "near-term" fetuses (Vitt & Blackburn 1991) with scalation and color pattern that could be scored, and therefore were likely a month or less away from parturition. As expected there is a positive correlation ($r^2 = 0.35$) between body size (mass or SVL) and litter size (Fig. 89A). Higher correlations were found when genera and species were analyzed separately, a pattern also observed with South American species (Vrcibradic & Rocha 2011). The two best represented genera were *Mabuya* ($r^2 = 0.48$; $y = 0.333x - 0.96$) and *Spondylurus* ($r^2 = 0.37$; $y = 0.179x + 1.30$). Differences among the genera are obvious in the graph and show that, for example, lizards of the same body size (e.g., 8 grams) have, on average, two young (*Mabuya*), three young (*Spondylurus*), and five young (*Capitellum*; one record). Presumably these differences are the result of different sizes of young at birth, with *Mabuya* having the largest and *Capitellum* the smallest. Unfortunately, the fetuses of most old specimens were too fragile to measure, and, even if measured, developmental size differences might obscure patterns. Somma and Brooks (1976) studied reproduction in the skink (*M. dominicana*) and two other species of lizards on Dominica. However, they were limited by the small sample size for *Mabuya* (seven pregnant females). They concluded that litter size averaged 3.3, and that two young lizards at birth measured 29 and 30 mm SVL.

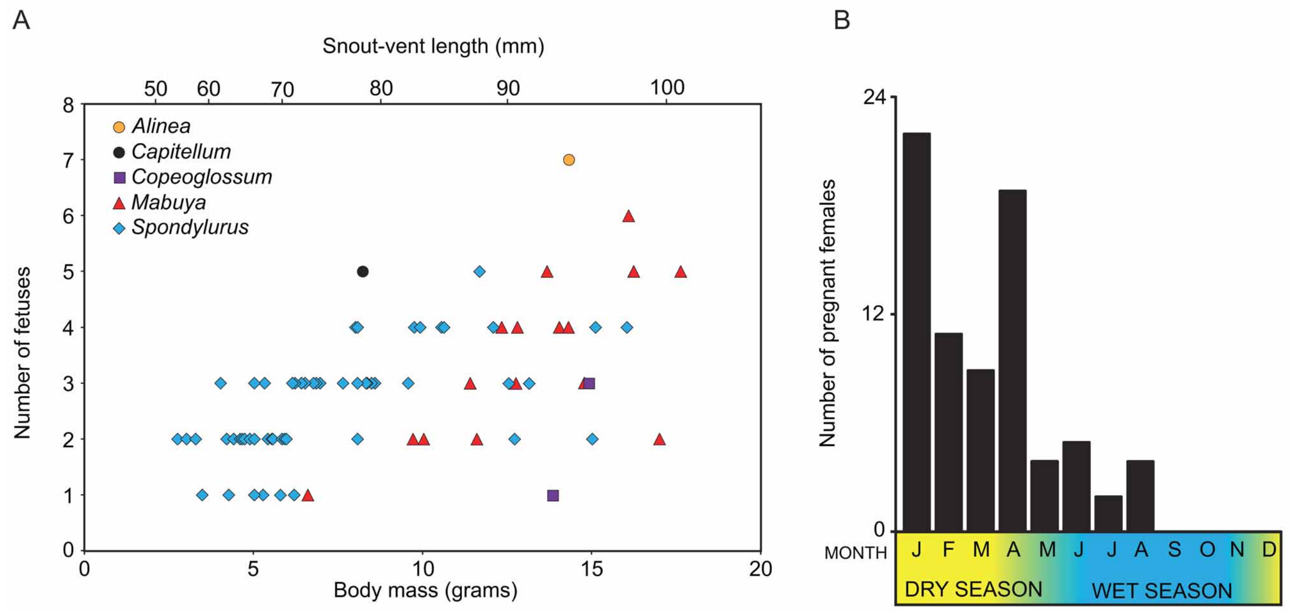

FIGURE 89. Reproduction in Caribbean island skinks. (A) relationship of body size to number of fetuses in pregnant females of five genera (18 species, 77 females). (B) histogram showing number of pregnant females collected during different months of the year.

A distinct seasonality is evident when dates of collection of pregnant females are summarized (Fig. 89B). Most pregnant females were collected during the first four months of the year. If it is assumed that they were approximately one month from parturition, then parturition probably peaks from February to May. This pattern was not a result of excess collecting activity at that time, because many non-pregnant females were collected during the summer months (July and August). Because skinks on Caribbean islands occur in lowlands, seasonality would be related mostly to rainfall and not temperature. January through March is generally the driest period on the islands, and June through October the wettest period. However, the wet season begins earlier (April) in the western Caribbean (e.g., Jamaica, Hispaniola) than in the Lesser Antilles, where it might not start until June or July. A recent review of skink reproduction in South America also concluded that parturition occurs at the dry-wet season transition (Vrcibradic & Rocha 2011), which is likely an evolutionary strategy for releasing offspring at a time when food is becoming more available.

Conservation

Based on IUCN Redlist criteria (IUCN 2011), we consider all of the 38 endemic species to be threatened with extinction. Two-thirds (27 species, 71%) are Critically Endangered, six species (16%) are Endangered, and five species (13%) are Vulnerable (Fig. 90A). Sixteen of the 38 endemic skink species on Caribbean islands are extinct or possibly extinct. There is strong evidence that a single introduced predator is largely, but not entirely, responsible for the decimation of the Caribbean islands skink fauna (Fig. 90B).

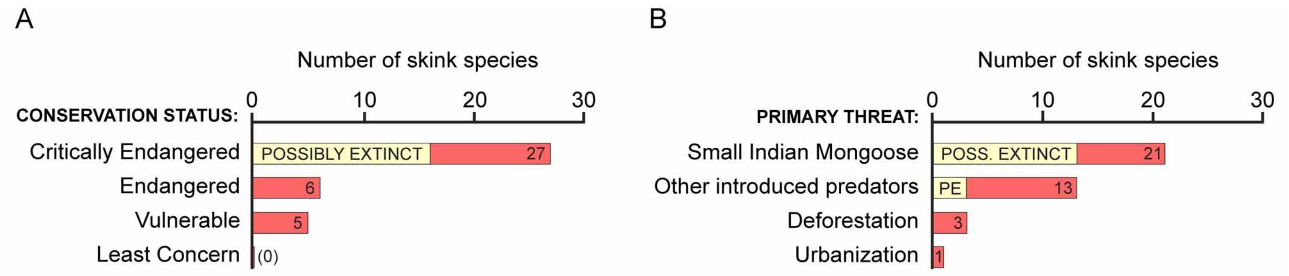

FIGURE 90. Summary graphs on the conservation of the 38 endemic species of skinks on Caribbean islands. (A) conservation status of the species, according to IUCN (2011) Redlist criteria. (B) primary threats to the survival of each species. The 16 species considered to be possibly extinct are indicated.

The Small Indian Mongoose, *Urva auropunctata*, was introduced throughout the larger, sugar-producing islands of the West Indies between 1872 and 1900 to control rodent populations in sugar cane fields (Espeut 1882; Palmer 1898; Nellis & Everard 1983; Horst *et al.* 2001; Patou *et al.* 2009). Those islands that have or had skinks, and the dates of introduction of the mongoose, include the following: Barbados (1882), Basse-Terre (1880–1885), Grande-Terre (1880–1885), Grenada (1876–1879), Hispaniola (1895), Jamaica (1872), Marie-Galante (1900), Martinique (1889), Puerto Rico (1877), St. Croix (1882–1884), St. John (1899; assumed as for St. Thomas), St. Lucia (1900), St. Martin (1885–1889), St. Thomas (1899), St. Vincent (1900), Tortola (1900), Trinidad (1882), Vieques (1877–1898), and Water Island (1930–1983).

Although the dates of mongoose introduction varied, all successful introductions in the Americas stemmed from a single introduction in February, 1872, when W. Bancroft Espeut, a British plantation owner on Jamaica, imported nine individuals from Calcutta to control the introduced rodents in his sugar cane field. The rodents included *Rattus rattus* (Black Rat), *R. norvegicus* (Brown Rat), and *Mus musculus* (House Mouse). He dispersed progeny to other islands. As a member of the Linnaean Society of London, he wrote an article for their *Proceedings* (Espeut 1882), documenting this event and noting the economic benefit. However, population studies of the mongoose and those three introduced rodents on Jamaica show that only the Brown Rat appears to have been negatively impacted by the mongoose (Hoagland *et al.* 1989). In fact, *R. rattus* is adept at climbing trees, allowing it to escape predation, because the mongoose is not a good climber. Therefore, the introduction of the mongoose was only partly successful in controlling rodents. For the native wildlife, especially diurnal, terrestrial species, the mongoose introduction was a disaster, causing noticeable reductions and extinctions in native species of vertebrates (Fielden 1889; Barbour 1930b; Westermann 1953; Nellis & Everard 1983; Henderson 1992; Horst *et al.* 2001; Breuil 2002; Powell & Henderson 2005; Daltry 2009). It has been nearly impossible to eradicate except from the smallest (< 100 hectares) of islands (McNair 2003); therefore, many large islands in the Caribbean have had resident mongoose populations now for more than 100 years.

With the revised taxonomy proposed here, we have examined the impact of the mongoose on Caribbean island skinks. We identified 20 species that occur on islands occupied by the mongoose. Because some islands have more than one species of skink, there are 27 island-species lineages on islands with mongooses, and at least 75 island-species lineages on islands that are mongoose-free (Figs. 91–92).

By using observations and collection dates for museum specimens, it was possible to track the presence of island-lineages of skinks through historical time. A lineage was considered extirpated from an island if herpetological collection efforts were made subsequent to the last record for the island but yielded no skinks. A summary of the results (Fig. 93) shows a dramatic loss of skink island-lineages following the introductions of the mongoose, but relatively few losses of lineages on mongoose-free islands. Specifically, it shows that, on mongoose-free islands, there have been four extirpations and three possible extinctions (*Mabuya montserratae* **sp. nov.**, *S. magnacruzae* **sp. nov.**, and *Copeoglossum redondae* **sp. nov.**). In contrast, on islands with mongooses, there have been 20 extirpations and 13 possible species extinctions (*Alinea lanceolata*, *A. luciae*, *Capitellum mariagalantae* **sp. nov.**, *C. metallicum*, *C. parvicruzae* **sp. nov.**, *Mabuya grandisterrae* **sp. nov.**, *M. guadeloupae* **sp. nov.**, *M. hispaniolae* **sp. nov.**, *M. mabouya*, *Spondylurus haitiae* **sp. nov.**, *S. lineolatus*, *S. martinae* **sp. nov.**, and *S. spilonotus*). Most of those species probably disappeared in what was essentially a mass extinction event at the end of the nineteenth century (Fig. 93). The severity of the event was most likely related to the similarity in ecological habits (diurnal, ground-dwelling) of predator and prey, but may have been intensified by the unusually long gestation period (9–12 months) of the skinks.

The initial slight decline (1820–1870) on islands with mongooses (Fig. 93), prior to the introductions of the mongoose, is expected, statistically, from sparse sampling of time-series data and is similar to the sampling effect observed in the fossil record (Signor & Lipps 1982). In other words, if any given species of skink is sampled only a few times during the entire nineteenth century, decade-long gaps in sampling are expected by chance for some species, as was observed. Another pattern evident in the analysis is that mongoose-inhabited islands (Fig. 92) have earlier records of skinks, prior to 1860, compared with mongoose-free islands (Fig. 91). The most likely explanation is that mongooses were introduced to islands that had earlier and larger human settlements, and were thus more accessible to early collectors. Agriculture, especially sugar-cane, was the major economy at that time and the mongoose was released to protect agricultural investments.

The two possible skink extinctions that occurred on mongoose-free islands require comment. Few biologists have visited Redonda, which is uninhabited, because of its remote location and inaccessibility. Daltry (2007) did not find *Copeoglossum redondae* **sp. nov.** there and considered its status "unknown." Redonda was occupied by Guano miners for about 50 years in the late 19th and early 20th centuries and now has feral goats and black rats. More surveys are warranted. The assignment of the possible extinction of *Spondylurus magnacruzae* **sp. nov.** to a mongoose-free island is somewhat misleading. It was apparently extirpated from the main island of St. Croix (212 km^2) by mongoose predation, in the nineteenth century, but survived until at least 1963 on a small, mongoose-free islet of St. Croix, Green Cay (0.05 km^2). It has not been seen there in recent years, but more surveys are warranted. Hence the extinction event for *S. magnacruzae* **sp. nov.** technically occurred on a mongoose-free island yet the primary agent involved in its decline, throughout 99.9% of its range (St. Croix), was the mongoose.

The data here track presence and absence of lineages on islands, but there is also evidence of an impact at the population level (Henderson 1992). For example, Pacific islands that have been studied have shown a 100-fold negative impact by the mongoose on abundance of diurnal lizards (Case 1991). On Caribbean islands, there are accounts of the high abundance of reptiles before the mongoose introductions (Gosse 1851) and low abundance after the introductions (Fielden 1889; Stejneger 1904; Barbour 1910; Grant 1940). Fielden (1889) noted declines on Barbados only seven years after the mongoose was released on that island and attributed the declines to the mongoose. Today, skinks are not rare on mongoose-free islands such as Anguilla, the Caicos Islands, Dominica, the Grenadines, and Guana. In contrast they are missing from almost all islands with mongooses, and the few species apparently still extant are rare. For example, *Spondylurus lineolatus* was discovered decades after the mongoose was released on Hispaniola (Noble & Hassler 1933), and it was considered to be rare within its habitat at that time. This rarity was attributed to the mongoose (Barbour 1937). The most recent collection of the species was in 1985, despite subsequent visits by herpetologists to known localities and other sites within the range of the species.

Jamaican skinks (*Spondylurus fulgidus*) have all but disappeared, where they once had a wider distribution and were abundant in the mid-nineteenth century (Gosse 1849; 1851). In recent years they have only been observed (rarely) in two dry-forest locations on the south coast: Portland Ridge and Hellshire Hills (Byron Wilson, personal communication), where they are a significant prey species of the mongoose (Lewis *et al.* 2011). The situation concerning the two extant species occurring on mongoose islands in the Virgin Islands is uncertain. It is not known when the mongoose became established on Water Island, but it was likely in the mid–20th century, because Barbour (1930b) reported it absent and Nellis & Everard (1983) reported it present on the island. The only skink record from that island was in 1964. Skinks have been observed in recent years on Tortola, despite the presence of the mongoose on that island.

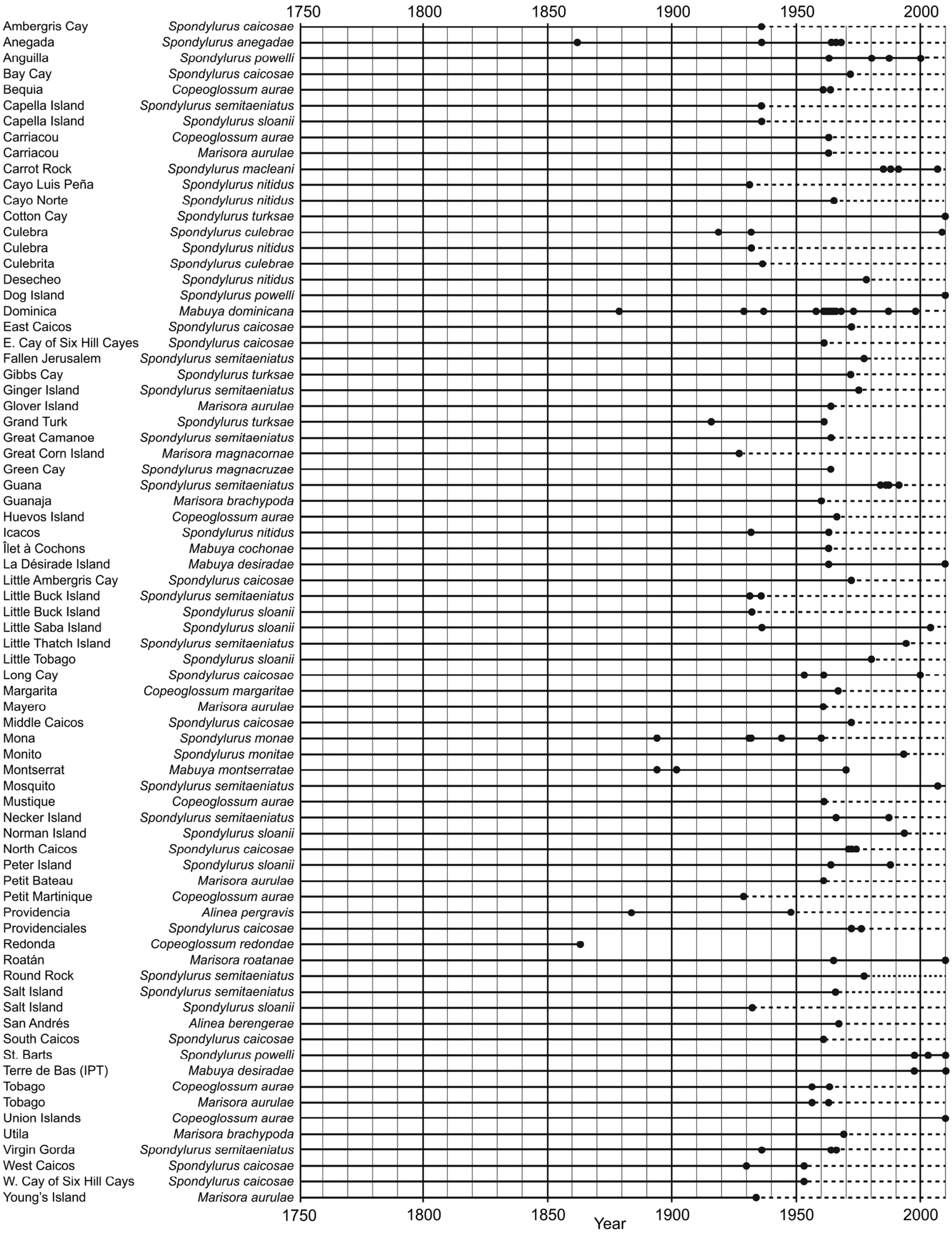

FIGURE 91. The presence of mabuyine skinks, through time, on Caribbean islands without mongooses. Black circles indicate a year when a specimen was collected (or, in a few cases, a literature record or photograph reproduced herein). Continuous black lines connecting circles indicate presumed presence of the species on the island (i.e., backward in time from the last record). If efforts to locate the species, since the last record, have been unsuccessful, the line is not projected forward to the present. If no efforts have been made to locate the species on that island, a dashed line is projected forward, indicating its possible presence on the island.

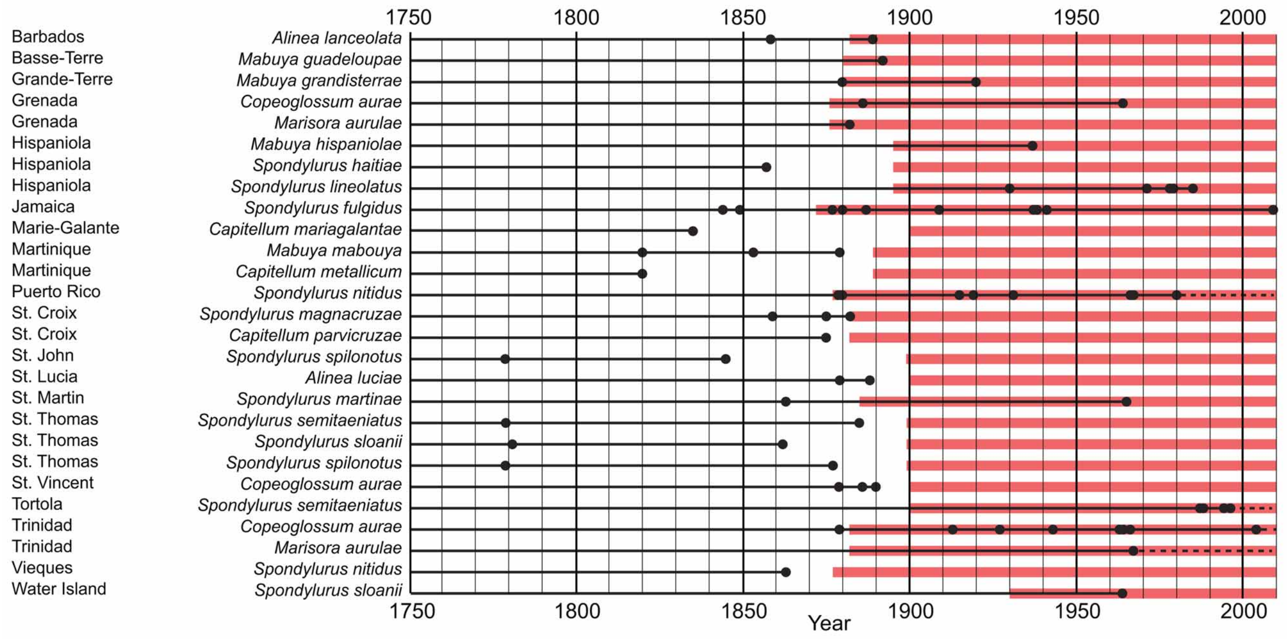

FIGURE 92. The presence of mabuyine skinks, through time, on Caribbean islands with mongooses. Symbols and methods as in Fig. 91. The presence of the mongoose is indicated in red, from the date of introduction (or first date of a range) until the present. The mongoose has not been extirpated from any of these islands.

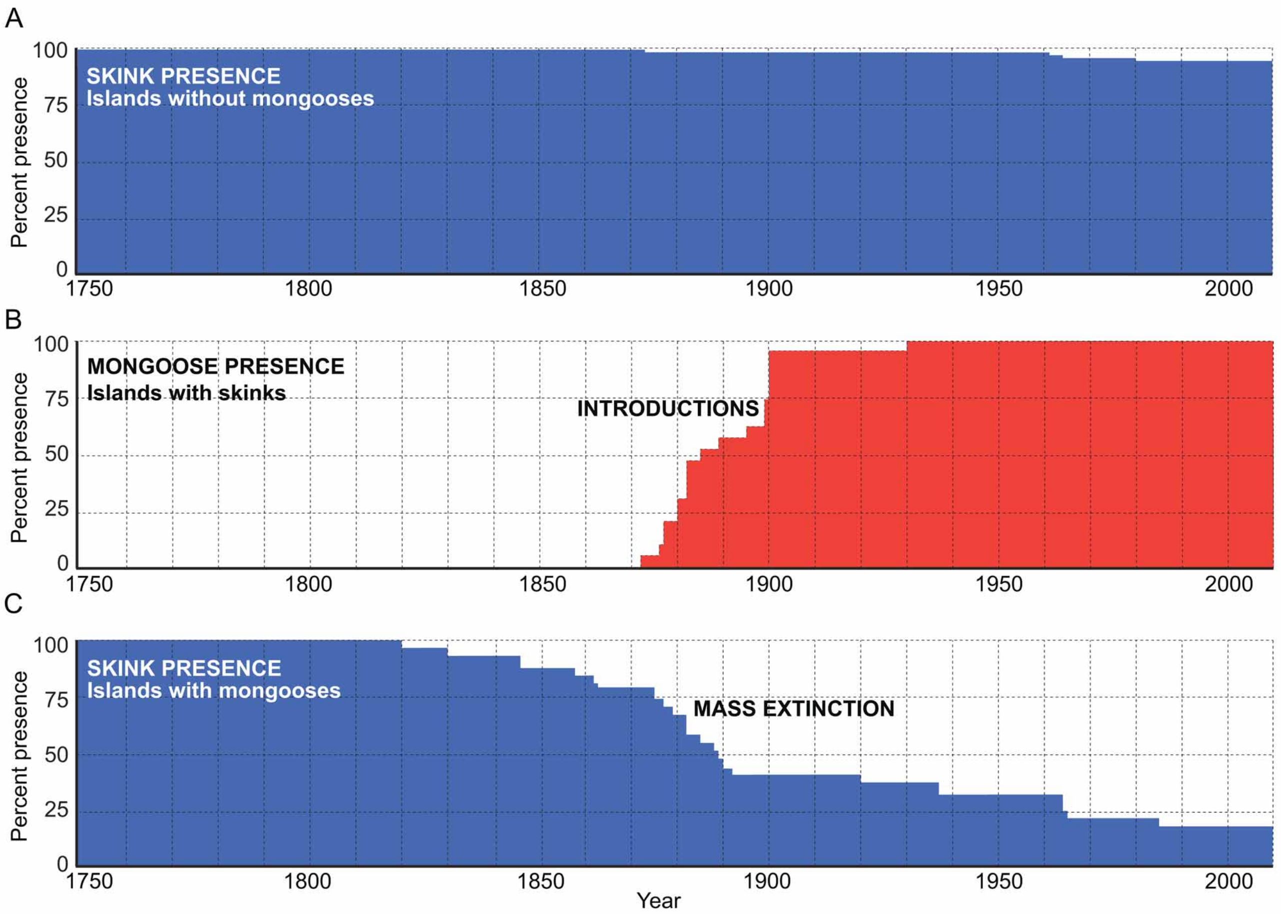

FIGURE 93. Summary diagrams showing presence of Caribbean skinks and mongooses on islands through time, from the data in Figs. 91–92. (A) presence of skinks on islands without mongooses. (B) presence of mongooses on 18 islands with skink records (nearly all introductions of mongooses occurred during 1872–1900). (C) presence of skinks on islands with mongooses.

The skink species of Puerto Rico (*Spondylurus nitidus*) shares a parallel history with that of Jamaica. A significant reduction in population levels was seen after the mongoose was introduced (Stejneger 1904) but it continued to survive as a species, perhaps because of its ability to climb trees. Nonetheless, the last confirmed museum record dates to 1980. The absence of subsequent specimens or photographs is cause for concern, given the large number of amateur and professional herpetologists living in Puerto Rico. Undocumented observations are of limited value given the possibility of confusion with other species (see Remarks for *S. nitidus*).

The devastating effect of the mongoose on the skink fauna of Caribbean islands can be largely attributed to the fact that most of the species have evolved in the absence of mammalian predators that normally occur on the Central and South American mainland. Anti-predatory adaptations are costly and are often lost in species that colonize islands (Blumstein & Daniel 2005). Trinidad is unusual because of its past geological connections with South America and in having a continental mammalian fauna that includes natural predators of skinks. This probably explains why one skink species, *Copeoglossum aurae* **sp. nov.**, on that island has not suffered as greatly as on other Caribbean islands (Murphy 1997). However, the sympatric species on Trinidad, *Marisora aurulae* **sp. nov.**, has not been collected in decades on that island and may have been extirpated by the mongoose. The rock and tree-climbing ability of some species, such as the Jamaican Skink (*Spondylurus fulgidus*), may have helped them survive longer than other species (Grant 1940). The apparently early disappearance, in the nineteenth century, of all three species of Antillean Small-headed Skinks (*Capitellum*) may be related to their lack of adaptations for climbing.

The last records for two Caribbean island skink species were, oddly, from major cities in the early 20th century: *Mabuya grandisterrae* **sp. nov.** from Pointe-à-Pitre, Guadeloupe (in 1920) and *Mabuya hispaniolae* **sp. nov.** from Santo Domingo, Hispaniola (in 1937). The collection of the latter species is especially intriguing because it was found near a hotel in the center of the city, yet no other specimens are known from anywhere on the island. Because mongooses are less abundant in urban areas, cities may have been the last refuges for some species before they finally disappeared (see Remarks for *M. hispaniolae* **sp. nov.**). A similar pattern of survival in cities was noted by Barbour (1937) for several species of Caribbean ground lizards of the Genus *Ameiva*, including *A. dorsalis* Gray from Jamaica, *A. erythrocephala* (Daudin) from St. Kitts, and *A. griswoldi* Barbour from Antigua. Barbour (1937) noted that these species were taking refuge in cities "where the mongoose population is kept in hand" (presumably by dogs; Byron Wilson, personal communication). We agree, and we add *M. grandisterrae* **sp. nov.** and *M. hispaniolae* **sp. nov.** to the list of species showing what could be called an "urban survival" effect as a result of mongoose predation. Baskin and Williams (1966) did not trust Barbour's observations, but much of Barbour's concern regarding the impact of the mongoose has proven to be correct.

Most previous authors also have considered the mongoose to be a major, if not the major, cause of extirpations and extinctions of Caribbean island reptiles (Barbour 1910, 1930b; Henderson 1992; Breuil 2002; Powell & Henderson 2005; Lorvelec *et al.* 2007; Daltry 2009; Lewis *et al.* 2011). However, two reviews (Corke 1992; Hays & Conant 2007) were more equivocal in attributing blame to the mongoose for extinctions. Corke (1992), in particular, made arguments that other factors were responsible for the decline or extinction of reptile species instead of the mongoose. These included island size, unspecified anthropogenic effects, persecution by humans, and predation by other introduced species (e.g., rats). We disagree with Corke (1992) and with Hays and Conant (2007) that additional data are needed to confirm a detrimental effect by the mongoose on the native reptiles of the Caribbean islands. There is sufficient evidence implicating this invasive species and warranting any efforts to eradicate it from islands wherever possible.

The data presented here (Figs. 91–93) provide the most substantial evidence that the mongoose, in particular, has been the major cause of extirpations and extinctions of Caribbean island reptiles. The positive association between island size and mongoose presence, as noted above, is because mongoose introductions were tied to agriculture on large islands. It is not related to a greater abundance of dry habitat on small islands, as suggested by Corke (1992), because larger islands usually have more dry habitat, and at least one large island that is mongoose-free (Dominica) has not lost its skinks. Caribbean island skinks have been found in cities, as discussed above, and in association with human dwellings (MacLean 1982; Rivero 1998). In fact the general pattern whereby the last havens for skinks appear to be around humans, rather than far away from humans, argues against the suggestion by Corke (1992) that the declines were caused by some unspecified anthropogenic factor.

Persecution of snakes and other reptiles occurs throughout the world and has undoubtedly had negative effects on population levels. Nonetheless, introduced predators, especially those in great abundance such as the mongoose, are many times more detrimental to native species. This was evident in a recent study of mongoose stomach contents showing that the nearly extinct Jamaican Skink comprised 10% of the diet, despite the skink being rarely observed in the same habitat (Lewis *et al.* 2011), indicating that the mongoose is better than humans at finding these small reptiles.

Black and Norway rats were probably brought to the West Indies by Columbus or soon thereafter, and their establishment is documented from at least the 1600s (Pimentel 1955). Like other invasive species they have had significant negative effects on biodiversity, but the timing of the decline in skink species (Figs. 91–93) and skink abundance (from literature accounts), in the late 1800s, is consistent with a primary effect from mongooses and not rats. Thus, contrary to the position of Corke (1992), we find evidence that the mongoose, more than other invasive species, has decimated the skink fauna of Caribbean islands.

Humans have affected the skinks and other native reptiles of Caribbean islands in other ways besides the introduction of the mongoose. Other predators have been introduced, such as rats, cats, dogs, pigs, and opossums. All of these have had a negative impact on the native reptiles and should not be underestimated (Lowe *et al.* 2000; Daltry 2009). For example, the grazing and browsing animals (sheep, goats, cattle, etc.) have indirectly affected species abundance through destruction of habitat (Westermann 1953). Feral cats have been singled out for the loss of some species of birds and lizards, and introduced rats for other species (Barbour 1930b; Westermann 1953). Habitat destruction is severe on Caribbean islands, with levels of remaining original, primary forest being among the lowest in the world. Precise estimates of remaining primary forest are difficult to make and are available for only a few Caribbean islands (FAO 2005). In those cases they show low levels, such as 2–3% for Grenada and Trinidad and Tobago. Haiti may have less than 1% of its original forest, and primary forest on Cuba and Hispaniola is unlikely to be much more than 10% (Hedges 2006a). Forest cover estimates are often misinterpreted because the FAO presents some higher numbers labeled as "natural forest," but these estimates include forests with as low as 10% canopy cover (i.e., 90% missing trees). For most species, it is the "primary forest" category, not the "natural forest" category, that is relevant.

The decimation of the Caribbean skink fauna in the late 19th century occurred before intensive herpetological work was conducted on the islands. Most of the 16 species that are possibly extinct are represented by only one or a few specimens that were typically collected serendipitously by botanists, pharmacists, medical doctors, and military personnel before the mongoose was introduced. This implies that there must have been species not collected that have since disappeared without leaving a trace. Disjunct distributions of some genera, such as *Capitellum*, on three non-adjacent islands, with only one specimen known from each species, also support that hypothesis. Unfortunately it would be difficult to accurately estimate the size or composition of this "ghost fauna."

Are there natural predators in the West Indies that help to control the mongoose? About the only species capable of having an impact are the large snakes of the Family Boidae, some of which are known to kill and consume mongooses (Barbour 1930b). The Cuban species, *Epicrates angulifer* (up to four meters SVL), is the largest in the West Indies (Schwartz & Henderson 1991), and that fact might explain why population numbers of the mongoose appear to be lower, and ground-dwelling diurnal reptiles (e.g., racer snakes) more abundant, on that island. Even a modest level of predation may have helped extend the survival of some skink species (Figs. 91–92). However, the persecution of boas and other snakes in the West Indies (Gosse 1851; Oliver 1982; Henderson & Powell 2009), especially on Jamaica, may have reduced the effectiveness of this potential native biological control agent. If Caribbean island boas are the first line of defense against the mongoose, increased efforts will need to be made to educate Caribbean islanders, especially the children, about the positive benefits of boas and other snakes.

In summary, humans have had a major, negative impact on the Caribbean island skink fauna because of the introduction of mammalian predators and habitat alteration and destruction. We have shown here that the impact of one particular introduced predator, the mongoose, has been much greater than perhaps all other factors combined.

Conclusions and recommendations

We did not expect to find a new skink fauna when we started this study. Only a single, wide-ranging species was recognized on most Caribbean islands for much of the last century. Now, the composition of the West Indian lizard fauna has changed, with skinks moving from one of the smallest to one of the largest groups of lizards in the West Indies. The 38 endemic species recognized here include a range of body shapes and sizes, and apparently different lifestyles. Some islands in both the Greater and Lesser Antilles have (or had) sympatric species. The discovery of this amount of diversity in a region as well-studied as the Caribbean was a surprise. This revision will also provide future researchers with a systematic framework to explore ecological, evolutionary, and biogeographic questions on Caribbean skinks that otherwise would not have been possible to ask. For example, some of the topics that might be investigated include adaptive radiation, character displacement, competition, convergence, reproductive cycles, and speciation.

Sadly, all of the 38 endemic species of skinks on Caribbean islands are threatened with extinction, and 16 species may already be extinct. This highlights, once again, the importance of systematics for conservation (Wilson 2004). For example, under the previous taxonomic scheme involving one or two wide-ranging species, it was nearly impossible for a species to become extinct unless skinks were to disappear from all islands. As a result, neither of the wide-ranging "species," *Mabuya mabouya* (sensu lato) and *Mabuya sloanii* (sensu lato) has been considered to be threatened. At the same time, sixteen species quietly disappeared, most from mongoose predation, with essentially no response or conservation action. An incorrect taxonomy has kept this entire skink fauna effectively off the conservation radar, inhibiting funding for such things as eradication of introduced predators, habitat protection, and captive breeding, as well as ecological and evolutionary study. We hope that this work will correct this error and draw attention to these fascinating animals that have evolved and adapted over millions of years on islands of the Caribbean.

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APPENDIX 1: sequences used in the molecular analyses

Genbank numbers are listed for each of the four genes, as well as source numbers. Of the 76 new sequences used in this study, from 22 samples (indicated in bold), one 12S rRNA sequence included only 120 nucleotide sites and was therefore ineligible for Genbank submission. That sequence, obtained from sample *Spondylurus sloanii* 3, is CTTAGCCCTTAACATAGACAATACAAACACAATATTGTCCGCCAGAGAACTA-CAAGTGAAAAACTAGAAACTCCAAGGACTTGGCGGTGCCCCACATCAGCCTAGAGGAGCCTGTTCTAT. Locality data are summarized below. In addition, the Genbank database (Genbank 2011) should be consulted for other information on sequences, including authors, citations, localities, and sources of material; other information can be found in the original articles (see Materials and Methods). The source numbers listed in the table below are taken from those earlier studies and provided only for reference. NA = not applicable (sequence not obtained).

Localities of samples used in molecular analyses. *Aspronema cochabambae* 1 (Bolivia: Santa Cruz; vicinity of Pampagrande, 18° 05' S, 64° 06' W), *A. dorsivittatum* 1 (Brazil: Distrito Federal; Brasília), *A. dorsivittatum* 2 (Brazil: São Paulo; São Paulo), *A. dorsivittatum* 3 (Argentina: Cordoba; Rio Cuarto city), *Brasiliscincus agilis* 1 (Brazil: Bahia; Jacobina), *B. agilis* 2 (Brazil: Esperíto Santo; UHE Rosal), *B. agilis* 3 (Brazil: Pernambuco; Exu), *B. agilis* 4 (Brazil: Piaui; Serra das Confusões), *B. agilis* 5 (Brazil: Tocantins; Peixe), *B. caissara* 1–2 (Brazil: São Paulo; Massaguaçu beach, Caraguatatuba), *B. heathi* 1 (Brazil: Bahia; Mocambo do Vento), *B. heathi* 2 (Brazil: Bahia; Jacobina), *B. heathi* 3 (Brazil: Bahia; Alagoado), *B. heathi* 4 (Brazil: Bahia; Sueste island, Abrolhos archipelago), *B. heathi* 5 (Brazil: Bahia; Siriba island, Abrolhos archipelago), *B. heathi* 6 (Brazil: Rio Grande do Norte; Natal), *Copeoglossum aurae* **sp. nov.** 1–2 (Trinidad and Tobago: Trinidad; Talparo), ***C. aurae* sp. nov. 3** (Trinidad and Tobago: Trinidad; Manzanilla Beach), ***C. aurae* sp. nov. 4** (Grenadines: Union Island; Fort Hill), *C. aurae* **sp. nov.** 5 (Venezuela: Sucre; Península de Paria), *C. nigropunctatum* 1–2 (Brazil: Acre; ca. 5 km N. Porto Walter, inland from the Rio Juruá, 8° 15’ 31.2” S, 72° 46’ 37” W), *C. nigropunctatum* 3–4 (Brazil: Amapá; Igarapé Camaipí), *C. nigropunctatum* 5–7 (Brazil: Amazonas; Castanho, S. Manaus, 03° 30.9’ S, 59° 54.2’ W), *C. nigropunctatum* 8 (Brazil: Amazonas; 3° 30.9’S, 59° 54.2’ W), *C. nigropunctatum* 9 (Brazil: Amazonas; Rio Ituxi, Madeira Scheffer, 8° 20’ 47.0” S, 65° 42’ 57.9” W), *C. nigropunctatum* 10 (Brazil: Distrito Federal; Brasília), *C. nigropunctatum* 11 (Brazil: Ceará; Mulungú), *C. nigropunctatum* 12 (Brazil: Ceará; Pacoti), *C. nigropunctatum* 13 (Brazil: Goiás; Niquelândia), *C. nigropunctatum* 14–15 (Brazil: Mato Grosso; Aripuanã), *C. nigropunctatum* 16 (Brazil: Mato Grosso; UHE Manso), *C. nigropunctatum* 17–18 (Brazil: Pará; Agropecuaria Treviso LTDA, 3° 8’ 56.7” S, 54°50’ 26.8” W), *C. nigropunctatum* 19 (Brazil: Pará; Alter do Chão), *C. nigropunctatum* 20 (Brazil: Pará; Vai-Quem-Quer), *C. nigropunctatum* 21 (Brazil: Piauí; Uruçuí-uma), *C. nigropunctatum* 22–25 (Brazil: Rondônia; Parque Estadual Guajará-Mirim, 10° 19’ S, 64° 33’ W), *C. nigropunctatum* 26 (Brazil: Rondônia; Rio Formoso, Parque Estadual Guajará-Mirim, approx. 90 km N. Nova Mamoré, 10° 19’ S, 64° 33’ W), *C. nigropunctatum* 27–29 (Brazil: Roraima; Fazenda Nova Esperança, BR-210, 44 km W BR-174), *C. nigropunctatum* 30 (Brazil: Roraima; Fazenda Nova Esperança, 41 km W BR-174 on BR-210, approx. 10 km E. Rio Ajarani), *C. nigropunctatum* 31 (Colombia: Guainia; Puerto Inirida), *C. nigropunctatum* 32 (Guyana: Cuyuni-Mazaruni; 5° 37.8’ N, 60° 14.7’ W), *C. nigropunctatum* 33–34 (French Guiana: Arrondissement of Saint-Laurent-du-Maroni; Mitaraka), *C. nigropunctatum* 35–38 (French Guiana: Arrondissement of Cayenne; St. Eugène, 4.8500° N, 53.0613° W), *C. nigropunctatum* 39 (French Guiana: Arrondissement of Cayenne; summit of the Pic Coudreau), *C. nigropunctatum* 40 (French Guiana: Arrondissement of Cayenne; foot of the Pic Coudreau), *C. nigropunctatum* 41 (Venezuela: Aragua; Turiamo), ***C. nigropunctatum* 42** (French Guiana: St. Eugène), *Exila nigropalmata* 1 (Peru: Madre de Dios; Manu national park), *Mabuya dominicana* 1–2 (Dominica; exact locality unavailable), ***M. dominicana* 3** (Dominica: Jimmit), *Manciola guaporicola* 1 (Brazil: Mato Grosso do Sul; exact locality unknown), *M. guaporicola* 2 (Brazil: Mato Grosso; UHE Manso), *M. guaporicola* 3 (Brazil: Tocantins; Parque Nacional do Araguaia), *M. guaporicola* 4 (Bolivia: Beni; El Refugio), *Maracaiba meridensis* 1 (Venezuela: Mérida; Mérida), *M. meridensis* 2 (Venezuela: Mérida; Mont Zerpa, near Mérida), *M. zuliae* 1–2 (Venezuela: Zulia; Cerro el Mirador, 08° 36’ 45” N, 72° 31’ 34” W), *M. zuliae* 3 (Venezuela: Zulia; Río Escalante, Secteur El Cañon, Catatumbo), *M. zuliae* 4 (Venezuela: Zulia; La Orchila, S. de Perijá, 10° 48’ 44” N, 72° 21’ 13” W), *Marisora alliacea* 1 (Costa Rica: Limón; Tortugueros), *M. aurulae* **sp. nov.** 1 (Trinidad and Tobago: Tobago; Buccoo), *M. brachypoda* 1 (Guatemala: Zacapa; Zacapa), *M. brachypoda* 2 (Honduras: Islas de la Bahía; Isla de Útila), *M. brachypoda* 3 (Honduras: Olancho; Las Trojas, San Esteban), *M. brachypoda* 4 (Mexico: Guerrero; Chichihualco, 17° 39’ 32” N, 99° 42’ 07” W), *M. brachypoda* 5 (Mexico: Oaxaca; on road “El Camaron-Tehuantepec”), *M. falconensis* 1 (Brazil: Distrito Federal; Brasília), *M. falconensis* 2 (Venezuela: Falcón; Península de Paraguaná), ***M. roatanae* sp. nov. 1** (Honduras: Islas de la Bahía; Roatán), *Notomabuya frenata* 1 (Brazil: Goias; Santa Rita do Argaguia), *N. frenata* 2 (Brazil: Mato Grosso do Sul; exact locality unknown), *N. frenata* 3 (Brazil: Piaui; Serra das Confusões), *N. frenata* 4 (Brazil: Tocantins; Parque Nacional do Araguaia), *Orosaura nebulosylvestris* 1–2 (Venezuela: Aragua; Colonia Tovar), *O. nebulosylvestris* 3 (Venezuela: Lara; Cubiro, 9° 48’ 29.0” N, 69° 33’ 25” W), *O. nebulosylvestris* 4 (Venezuela: Miranda; Carrizal, Los Teques), *O. nebulosylvestris* 5 (Venezuela: Trujillo; Trujillo), *O. nebulosylvestris* 6 (Venezuela: Trujillo; Trujillo, near the Laguna Negra), *O. nebulosylvestris* 7–8 (Venezuela: Vargas; Pico Codazzi), *Panopa carvalhoi* 1 (Brazil: Roraima; junction BR-174 / BR-210), *P. croizati* 1 (Venezuela: Antzoátegui; Cerro El Guamal, Turimiquire massif), *Plestiodon laticeps* 1 (USA: Florida; Duval Co., Little Talbot Island), *Psychosaura agmosticha* 1–2 (Brazil: Algoas; Xingó), *P. macrorhyncha* 1–2 (Brazil: Sao Paulo; Ilha da Queimada

Grande), ***Spondylurus caicosae*** **sp. nov. 1–3** (Turks and Caicos: North Caicos; Wade's Green Plantation, about 2 mi. W Kew), ***S. culebrae*** **sp. nov. 1** (Puerto Rico: Culebra; exact locality unknown), ***S. fulgidus*** **1–3** (Jamaica: St. Catherine; Hellshire Hills), ***S. lineolatus*** **1** (Haiti: l'Artibonite; 10.4 km NW ça Soleil, 130 m), ***S. macleani*** **1** (British Virgin Islands: Carrot Rock), ***S. monitae*** **sp. nov. 1** (Puerto Rico: Isla Monito), *S. powelli* **sp. nov.** 1–2 (St. Barthélémy island), ***S. powelli*** **sp. nov. 3–4** (Anguilla: Junk's Hole; 18° 15' 8" N, 62° 59' 17" W), *S. semitaeniatus* 1 (British Virgin Islands: Guana Island), ***S. semitaeniatus*** **2** (British Virgin Islands: Mosquito Island), ***S. sloanii*** **1–3** (U.S. Virgin Islands: St. Thomas; Little Saba Island), *Trachylepis capensis* 1 (South Africa: Northern Cape; Richtersveld National Park, 28° 11' 02" S, 17° 02' 14" E, 580 m Elev), *T. quinquetaeniata* 1 (Unknown), *T. perrotetii* 1 (Ghana; USFWS), *Varzea altamazonica* 1 (Brazil: Acre; Estirão do Panela, PNSD), *V. altamazonica* 2 (Brazil: Amazonas; Rio Ituxi, Madeirera Scheffer), *V. altamazonica* 3 (Peru: San Martín; km 34 of the road "Tarapoto-Yurimaguas"), *V. altamazonica* 4 (Peru: San Martín; PN. Rio Abiseo, 07° 21' 44.9" S, 76° 50' 13.8" W), *V. bistriata* 1 (Brazil: Amazonas; Rio Ituxi, Madeirera Scheffer), *V. bistriata* 2 (French Guiana: Arrondissement of Cayenne; Matoury), ***V. bistriata*** **3** (French Guiana: Macouria).

		GenBank accession number			
Species	**Source**	**Cyt B**	**12S**	**16S**	**Myosin**
Aspronema cochabambae 1	ZFMK 72151	NA	AF202625	AF202630	NA
Aspronema dorsivittatum 1	E11106	EU443108	AY151426	AY151460	NA
Aspronema dorsivittatum 2	LG 1089	DQ239176	DQ239257	DQ238935	DQ239414
Aspronema dorsivittatum 3	LAv-5000	DQ239149	DQ239230	DQ238908	DQ239391
Brasiliscincus agilis 1	LG 464	DQ239175	DQ239256	DQ238934	DQ239413
Brasiliscincus agilis 2	MRT 1206	DQ239152	DQ239233	DQ238911	DQ239393
Brasiliscincus agilis 3	E11108	EU443102	AY151428	NA	NA
Brasiliscincus agilis 4	SC 21	DQ239170	DQ239251	NA	NA
Brasiliscincus agilis 5	MRT 3951	DQ239126	DQ239207	DQ238885	DQ239370
Brasiliscincus caissara 1	MNRJ9485	NA	AF548788	AF549176	NA
Brasiliscincus caissara 2	MNRJ9476	NA	AF548787	AF549175	NA
Brasiliscincus heathi 1	MRT 3671	DQ239163	DQ239244	DQ238922	DQ239406
Brasiliscincus heathi 2	907101	DQ239151	DQ239232	DQ238910	DQ239392
Brasiliscincus heathi 3	907011	DQ239150	DQ239231	DQ238909	NA
Brasiliscincus heathi 4	MNRJ 6655	NA	AF548785	AF549173	NA
Brasiliscincus heathi 5	MNRJ 6663	NA	AF548786	AF549174	NA
Brasiliscincus heathi 6	MNRJ 8361	NA	AF548784	AF549172	NA
Copeoglossum aurae **sp. nov.** 1	E11103	GQ982565	AY151436	AY151470	NA
Copeoglossum aurae **sp. nov.** 2	E11104	GQ982566	AY151437	AY151471	NA
Copeoglossum aurae **sp. nov. 3**	**CAS 231775**	**JN246081**	**NA**	**NA**	**NA**
Copeoglossum aurae **sp. nov. 4**	**SBH 268935**	**JN227555**	**JN227576**	**JN227595**	**NA**
Copeoglossum aurae **sp. nov.** 5	WES 636	GQ982567	GQ982544	NA	NA
Copeoglossum nigropunctatum 1	LSUMZ H-13610	DQ239188	DQ238269	DQ238947	NA
Copeoglossum nigropunctatum 2	LSUMZ H-13900	DQ239109	DQ239190	DQ238868	DQ239353
Copeoglossum nigropunctatum 3	MRT 6300	DQ239130	DQ239211	DQ238889	DQ239373
Copeoglossum nigropunctatum 4	MRT 6303	DQ239131	DQ239212	DQ238890	DQ239374
Copeoglossum nigropunctatum 5	LSUMZ H-16446	GQ982546	GQ982526	NA	NA
Copeoglossum nigropunctatum 6	OMNH 37687 (LSUMZ H-16441)	GQ982547	GQ982527	NA	NA
Copeoglossum nigropunctatum 7	LSUMZ H-16489	DQ239111	DQ239192	DQ238870	DQ239355
Copeoglossum nigropunctatum 8	LSUMZ H-16490	DQ239112	DQ239193	DQ238871	DQ239356
Copeoglossum nigropunctatum 9	OMNH 37186 (LSUMZ H-14107)	GQ982548	GQ982528	NA	NA
Copeoglossum nigropunctatum 10	CHUNB 9624	NA	AF548783	AF549171	NA
Copeoglossum nigropunctatum 11	MRT 154	DQ239159	DQ239240	DQ238918	DQ239403
Copeoglossum nigropunctatum 12	MRT 097	DQ239157	DQ239238	DQ238916	DQ239401
Copeoglossum nigropunctatum 13	LG 1085	DQ239168	DQ239249	DQ238927	DQ239408

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APPENDIX 1 (continued)

		GenBank accession number			
Species	**Source**	**Cyt B**	**12S**	**16S**	**Myosin**
Copeoglossum nigropunctatum 14	967956	DQ239174	DQ239255	DQ238933	NA
Copeoglossum nigropunctatum 15	967904	DQ239180	DQ239261	DQ238939	NA
Copeoglossum nigropunctatum 16	LG 1561	DQ239172	DQ239253	DQ238931	DQ239412
Copeoglossum nigropunctatum 17	LSUMZ H-14223	EU443118	DQ368667	NA	NA
Copeoglossum nigropunctatum 18	OMNH 36830 (LSUMZ H-14238)	GQ982549	GQ982529	NA	NA
Copeoglossum nigropunctatum 19	MRT 916872	DQ239177	DQ239258	DQ238936	DQ239415
Copeoglossum nigropunctatum 20	LG 756	DQ239158	DQ239239	DQ238917	DQ239402
Copeoglossum nigropunctatum 21	MRT 2502	DQ239167	DQ239248	DQ238926	DQ239407
Copeoglossum nigropunctatum 22	OMNH 37414 (LSUMZ h17860)	GQ982550	GQ982530	NA	NA
Copeoglossum nigropunctatum 23	OMNH 37417 (LSUMZ h17865)	GQ982551	GQ982531	NA	NA
Copeoglossum nigropunctatum 24	OMNH 37416 (LSUMZ h17863)	GQ982552	GQ982532	NA	NA
Copeoglossum nigropunctatum 25	OMNH 37413 (LSUMZ h17859)	GQ982553	GQ982533	NA	NA
Copeoglossum nigropunctatum 26	LSUMZ H17864	DQ239113	DQ239194	DQ238872	DQ239357
Copeoglossum nigropunctatum 27	OMNH 36316 (LSUMZ H12332)	GQ982554	GQ982534	NA	NA
Copeoglossum nigropunctatum 28	OMNH 36318 (LSUMZ H12369)	EU443119	DQ368668	NA	NA
Copeoglossum nigropunctatum 29	OMNH 36317 (LSUMZ H12365)	GQ982555	GQ982535	NA	NA
Copeoglossum nigropunctatum 30	LSUMZ H12311	DQ239187	DQ239268	DQ238946	DQ239424
Copeoglossum nigropunctatum 31	E111016	EU443120	AY151438	AY151484	NA
Copeoglossum nigropunctatum 32	BPN 160	GQ982556	GQ982536	NA	NA
Copeoglossum nigropunctatum 33	not collected	GQ982557	GQ982537	NA	NA
Copeoglossum nigropunctatum 34	not collected	GQ982558	GQ982538	NA	NA
Copeoglossum nigropunctatum 35	MNHN 2005-9719	GQ982559	DQ368666	NA	NA
Copeoglossum nigropunctatum 36	MNHN 2005.9721	GQ982560	GQ982539	NA	NA
Copeoglossum nigropunctatum 37	MNHN 2005.9717	GQ982561	GQ982540	NA	NA
Copeoglossum nigropunctatum 38	MNHN 2005.9720	GQ982562	GQ982541	NA	NA
Copeoglossum nigropunctatum 39	Michel Blanc	GQ982563	GQ982542	NA	NA
Copeoglossum nigropunctatum 40	MNHN 2004.0103	GQ982564	GQ982543	NA	NA
Copeoglossum nigropunctatum 41	MHNLS 17080	EU443121	EU477268	NA	NA
***Copeoglossum nigropunctatum* 42**	**SBH 267187**	**JN227568**	**JN227589**	**NA**	**JN227548**
Exila nigropalmata 1	MHNC 5718	EU515213	EU515211	NA	NA
Mabuya dominicana 1	MNHN 2003.0838	EU443114	EU477264	NA	NA
Mabuya dominicana 2	not collected	EU443115	EU477265	NA	NA
***Mabuya dominicana* 3**	**SBH 268001**	**JN227561**	**JN227582**	**JN227601**	**JN227542**
Manciola guaporicola 1	E11101	EU443112	AY151434	AY151468	NA
Manciola guaporicola 2	LG 1574	DQ239169	DQ239250	DQ238928	DQ239409
Manciola guaporicola 3	PNA 185	DQ239141	DQ239222	DQ238900	NA
Manciola guaporicola 4	UTA 55700	EU443113	EU477263	NA	NA
Maracaiba meridensis 1	not collected	EU443116	EU477266	NA	NA
Maracaiba meridensis 2	MHNLS 17081	EU443117	EU477267	NA	NA
Maracaiba zuliae 1	MHNLS 16676	EU443130	EU477276	NA	NA
Maracaiba zuliae 2	MHNLS 16677	EU443131	EU477277	NA	NA

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APPENDIX 1 (continued)

		GenBank accession number			
Species	**Source**	**Cyt B**	**12S**	**16S**	**Myosin**
Maracaiba zuliae 3	MHNLS 16647	EU443132	EU477278	NA	NA
Maracaiba zuliae 4	MNHN 2007.0273	EU443133	EU477279	NA	NA
Marisora alliacea 1	not collected	EU443125	EU477271	NA	NA
Marisora aurulae **sp. nov.** 1	ZFMK 62603	NA	AY070339	NA	NA
Marisora brachypoda 1	UTA 41513	EU443126	EU477272	NA	NA
Marisora brachypoda 2	SMF 79851	NA	AB057378	NA	NA
Marisora brachypoda 3	UTA 41227	EU443127	EU477273	NA	NA
Marisora brachypoda 4	not collected	EU443128	EU477274	NA	NA
Marisora brachypoda 5	not collected	EU443129	EU477275	NA	NA
Marisora falconensis 1	MHNLS 17095	EU443108	AY151426	NA	NA
Marisora falconensis 2	not collected	EU443110	EU477262	NA	NA
***Marisora roatanae* sp. nov. 1**	**SBH 269383**	**JN227571**	**JN227592**	**JN227610**	**NA**
Notomabuya frenata 1	LG 861	DQ239128	DQ239209	DQ238887	DQ239371
Notomabuya frenata 2	E11107	EU443111	AY151427	AY151461	NA
Notomabuya frenata 3	SC 28	DQ239173	DQ239254	DQ238932	NA
Notomabuya frenata 4	PNA 77	DQ239165	DQ239246	DQ238924	NA
Orosaura nebulosylvestris 1	MHNLS 17088	EU443134	EU477280	NA	NA
Orosaura nebulosylvestris 2	MNHN 2007.0272	EU443135	EU477281	NA	NA
Orosaura nebulosylvestris 3	MHNLS 17106	EU443136	EU477282	NA	NA
Orosaura nebulosylvestris 4	MHNLS 17330	EU443137	EU477283	NA	NA
Orosaura nebulosylvestris 5	not collected	EU443138	EU477284	NA	NA
Orosaura nebulosylvestris 6	MHNLS 16649	EU443139	EU477285	NA	NA
Orosaura nebulosylvestris 7	MHNLS 17093	EU443140	EU477286	NA	NA
Orosaura nebulosylvestris 8	MHNLS 17103	EU443141	EU477287	NA	NA
Panopa carvalhoi 1	OMNH 36332 (LSUMZ H-12420)	EU443106	EU477259	DQ238945	DQ239423
Panopa croizati 1	MHNLS 17670	EU443107	EU477260	NA	NA
Plestiodon laticeps 1	S8 (12S, 16S, cytB); BYU 47336 (myosin)	EU116510	AY218039	AY217989	DQ239427
Psychosaura agmosticha 1	LG 902	DQ239134	DQ239215	DQ238893	DQ239377
Psychosaura agmosticha 2	LG 901	DQ239133	DQ239214	DQ238892	DQ239376
Psychosaura macrorhyncha 1	LG 1102	DQ239162	DQ239243	DQ238921	DQ239405
Psychosaura macrorhyncha 2	LG 1103	DQ239132	DQ239213	DQ238891	DQ239375
***Spondylurus caicosae* sp. nov. 1**	**SBH 266355**	**JN227557**	**JN227578**	**JN227597**	**NA**
***Spondylurus caicosae* sp. nov. 2**	**SBH 266356**	**JN227558**	**JN227579**	**JN227598**	**JN227540**
***Spondylurus caicosae* sp. nov. 3**	**SBH 266357**	**JN227559**	**JN227580**	**JN227599**	**NA**
***Spondylurus culebrae* sp. nov. 1**	**SBH 268453**	**JN227560**	**JN227581**	**JN227600**	**JN227541**
***Spondylurus fulgidus* 1**	**SBH 267953**	**JN227562**	**JN227583**	**JN227602**	**JN227543**
***Spondylurus fulgidus* 2**	**SBH 267954**	**JN227563**	**JN227584**	**JN227603**	**JN227544**
***Spondylurus fulgidus* 3**	**SBH 267955**	**JN227564**	**JN227585**	**JN227604**	**JN227545**
***Spondylurus lineolatus* 1**	**USNM 329347**	**JN227565**	**JN227586**	**JN227605**	**JN227546**
***Spondylurus macleani* 1**	**USNM 576303**	**JN227566**	**JN227587**	**JN227606**	**JN227547**
***Spondylurus monitae* sp. nov. 1**	**USNM 576301**	**JN227567**	**JN227588**	**JN227607**	**NA**
Spondylurus powelli **sp. nov.** 1	MNHN 2003.0844	EU443122	EU477269	NA	NA
Spondylurus powelli **sp. nov.** 2	MNHN 2003.0843	EU443123	NA	NA	NA
***Spondylurus powelli* sp. nov. 3**	**SBH 267292**	**JN227569**	**JN227590**	**JN227608**	**JN227549**

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APPENDIX 1 (continued)

		GenBank accession number			
Species	**Source**	**Cyt B**	**12S**	**16S**	**Myosin**
***Spondylurus powelli* sp. nov. 4**	**SBH 267291**	**JN227570**	**JN227591**	**JN227609**	**JN227550**
Spondylurus semitaeniatus 1	YPM 15082	EU443124	EU477270	NA	NA
***Spondylurus semitaeniatus* 2**	**MCZ R185692**	**JN227572**	**JN227593**	**JN227611**	**JN227551**
***Spondylurus sloanii* 1**	**USNM 576305**	**JN227573**	**JN227594**	**NA**	**JN227552**
***Spondylurus sloanii* 2**	**USNM 576306**	**JN227574**	**NA**	**JN227612**	**NA**
***Spondylurus sloanii* 3**	**USNM 576307**	**JN227575**	**See text**	**JN227613**	**NA**
Trachylepis capensis 1	AMB 4765	DQ239178	DQ239259	DQ238937	DQ239416
Trachylepis perrotetii 1	FMNH 262227	DQ239146	DQ239227	DQ238905	DQ239388
Trachylepis quinquetaeniata 1	BYU 47330	DQ239183	DQ239264	DQ238942	DQ239420
Varzea altamazonica 1	MBS 001	DQ239129	DQ239210	DQ238888	DQ239372
Varzea altamazonica 2	OMNH 37191 (LSUMZ H-14114)	GQ982545	GQ982525	NA	NA
Varzea altamazonica 3	MNHN 2002.0291	EU443103	DQ368663	NA	NA
Varzea altamazonica 4	MHNC 6703	EU515212	EU515210	NA	NA
Varzea bistriata 1	OMNH 37183 (LSUMZ H-14104)	EU443104	EU477258	NA	NA
Varzea bistriata 2	not collected	EU443105	DQ368664	NA	NA
***Varzea bistriata* 3**	**SBH 267186**	**JN227556**	**JN227577**	**JN227596**	**JN227539**

APPENDIX 2: other specimens examined

Aspronema dorsivittatum (CM 57069, Uruguay; TCWC 53404, Tucuman, Argentina; TCWC 69341, 70252, and 70931, Formosa, Argentina; USNM 148784–85, Brazil). *Brasiliscincus agilis* (USNM 98600, 98605–06, and 217636, Brazil). *Brasiliscincus caissara* (USNM 217638, Brazil). *Brasiliscincus heathi* (USNM 209647–50, Brazil). *Copeoglossum arajara* (USNM 217645, Brazil). *Copeoglossum nigropunctatum* (BMNH 1946.8.15.12, "Saint Vincent" (probably in error); BMNH 1946.8.19.78; "West Indies" (probably in error); CAS 49772, Matto Grosso, Brazil; CM S5370, 49530, 136106, 136116, 136122, and 136131, Guyana; CM S7833–34, S7844, and 22819, Venezuela; MNHN 1996.4570–72 and 1997.2206–07, French Guiana; TCWC 59228, Miranda, Venezuela; TCWC 59750, Monagas, Venezuela; UF 63173, Suriname; UIMNH 22264–67 and 93927–30, Delta Amacuro, Venezuela; UIMNH 22268, Sucre, Venezuela; UMMZ 84742, Napo, Ecuador; UMMZ 85261, 85263, and 239607, Guyana). *Manciola guaporicola* (USNM 217639–40, Brazil). *Maracaiba meridensis* (UMMZ 57435, Merida, Venezuela). *Marisora alliacea* (UF 30454, 30459–60, 30467, and 30471, Costa Rica; USNM 19542, Nicaragua). *Marisora brachypoda* (AMNH R-91003 and R-94697, Oaxaca, Mexico; CM 41258 and 52754, Mexico; CM 65381–87, Honduras; KU 157475–76, Yucatán, Mexico; LSUMZ 10282, Belize; LSUMZ 21883, Guanaja, Honduras; LSUMZ 22309, Utila, Honduras; LSUMZ 33344, Quintana Roo, Mexico; RT 1729 and UF 143817, Guanacaste, Costa Rica; TCWC 17163, El Progreso, Guatemala; TCWC 17165, 84023, and 84025, Puntarenas, Costa Rica; TCWC 19211–12, Cortes, Honduras; TCWC 55585, Zelaya, Nicaragua; TCWC 55586–89, Zelaya, Nicaragua; TCWC 55590, Rivas, Nicaragua; TCWC 80536, Guanacaste, Costa Rica; UF 24600, Guatemala; USNM 16145 and 19872–73, Nicaragua). *Marisora falconensis* (CM S7985 and 22820, Venezuela; TCWC 59229, Guarico, Venezuela; UIMNH 93931 and 93944 and UPRRP 2509–10, Aragua, Venezuela; UMMZ 55924, Yaracuy, Venezuela; UMMZ 55927 and 55932, Tucacas, Venezuela); associated specimen (UMMZ 54793, Guajira, Colombia). *Marisora unimarginata* (CM 43593–95, UF 143888–90, and UPRRP 6495, Panama; RT 1761 and TCWC 17164, San Jose, Costa Rica). *Notomabuya frenata* (CM 142422, 142380, and 142496, Paraguay; TCWC 69342, 70113, 70251, and 70340, Formosa, Argentina; TCWC 70289–90, Corrientes, Argentina). *Panopa carvalhoi* (USNM 217138, Venezuela). *Panopa croizati* (CM S7988–89 and S7993, Venezuela). *Psychosaura macrorhyncha* (USNM 217643, Brazil). *Varzea bistriata* (AMNH R-36553–54 and R-37852–54, Cucuhy, Brazil; CAS 49769, Amazonas, Brazil).