

REPTILIA: SQUAMATA: SPHAERODACTYLIDAE

Sphaerodactylus vincenti

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***Sphaerodactylus vincenti* Boulenger**
Windward Islands Dwarf Gecko

Sphaerodactylus vincenti Boulenger 1891:354. Type-locality, "St. Vincent." Syntypes, British Museum of Natural History (BMNH) 1946.8.26.38–48; BMNH 1946.8.26.38–39 are listed as males, whereas 1946.8.26.40–48 are recorded as male, female, and "half-grown" (C. McCarthy, BMNH, *in litt.*, 3.1.2007), collected by H.H. Smith, date of collection unknown (not examined by authors). See **Comment**.

• **CONTENT.** The *S. vincenti* complex includes nine currently recognized subspecies (Schwartz 1964): *S. v. vincenti*, *S. v. adamas*, *S. v. diamesus*, *S. v. festus*, *S. v. josephinae*, *S. v. monilifer*, *S. v. pheristus*, *S. v. psamminus*, and *S. v. ronaldi*.

• **DEFINITION.** *Sphaerodactylus vincenti* is a relatively large dwarf gecko, with a maximum SVL of 40 mm in males and females. Keeled dorsal scales are small, number 29–64 from axilla to groin, and have both knoblike and hair-bearing scale organs. A mid-dorsal area of smaller scales is present. Ventral scales range from smooth and cycloid to keeled and acute and number 26–38 from axilla to groin. Scale rows at midbody number 44–75. Dorsal caudal scales are keeled, flat, imbricate, and acute. Subcaudals are cycloid, imbricate, and with an enlarged midventral row. Snout scales are flat, keeled, and juxtaposed. One postnasal, 0–3 internasals, and 2–4 upper labials to mid-eye are present. Gular scales are strong to weakly keeled, and chest scales are smooth or keeled. Escutcheons are 3–11 scales long and 18–36 scales wide (Schwartz and Henderson 1991).

Sexual dichromatism is absent in most populations. Ground color of the head is light to medium brown or yellow. Dorsal ground color ranges from dirty yellow to some shade of brown or grayish-brown, often speckled with darker brown. Limbs may be marbled with dark brown. The venter is pale purplish or grayish pink, light to medium brown, or gray. Chin and throat are uniform light brown or deep yellow to deep orange, sometimes with gray or brown bars or vermiculations. The underside of the tail is light brown to dull orange or rosy orange. The iris is brown, blue, blue-gray, or bluish green. The dorsum may be uniformly colored, but many individuals in most populations exhibit some pattern elements, which are extremely variable, but usually include a pair of black-edged white ocelli or a nuchal bar or a widely opened white or light brown V (most evident in juveniles). Light suprapostorbital lines often are present, joining in the region of the ocelli (if present) and, in some cases, extending onto the trunk. Fused spots in the pelvic region may form a prominent white or gray V (Schwartz and Henderson 1991). See subspecific



FIGURE 1. Adult male (top) and female *Sphaerodactylus vincenti vincenti* from Kingstown, St. George's Parish, St. Vincent. Photographs by Robert Powell.

definitions for details of variation in individual populations.

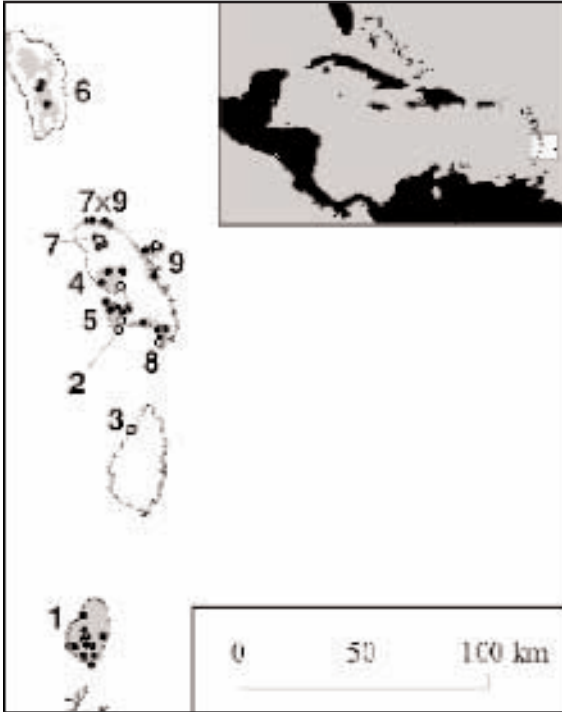
• **DIAGNOSIS.** *Sphaerodactylus vincenti* is best distinguished from its presumed closest relative and neighbor to the south (*S. kirbyi*) by having much smaller scales (sum of lateral and middorsal scales in *S. kirbyi* is 23–28, whereas *S. vincenti* has 31–36); *S. kirbyi* also lacks the keeled gulars, rich head coloration, and blue-green iris of *S. vincenti*.

Sphaerodactylus vincenti can be distinguished (Schwartz and Henderson 1985) from sympatric Lesser Antillean congeners by smooth, rounded ventrals and laterally expanded median subcaudals (*S. microlepis* has keeled, acute ventrals and median subcaudals are not expanded; Schwartz 1965) and by ocelli (if present) and lack of a sharply contrasting head color and pattern or dorsal lineate pattern (male *S. fantasticus* have a sharply demarcated deep blue head with scattered light blue spots and females almost always have a V on the head that continues as stripes onto the body; Malhotra and Thorpe 1999).

• **DESCRIPTIONS.** Detailed descriptions of the species, other than the original of Boulenger (1891), are in Barbour (1921), King (1962), Lazell (1994), Malhotra and Thorpe (1999), Schwartz 1965, and Schwartz and Henderson (1991).

• **ILLUSTRATIONS.** Malhotra and Thorpe (1999), de Silva and Wilson (2006), Powell (2007), and Marcum et al. (in press) included color photographs. Treglia (2006) included a black-and-white photograph. Line drawings are in Barbour (1921), King (1962), Lazell (1994), and Schwartz (1964, 1965).

• **DISTRIBUTION.** *Sphaerodactylus vincenti* is known to occur on the St. Lucia, Dominica, Martinique, and St. Vincent island banks. The species is locally abundant on St. Vincent (Steinberg et al. 2007), sporadic on Martinique, and rarely encountered on Dominica and St. Lucia (Schwartz 1965). These lizards are found in leaf litter, under rocks and rotten logs, and in bromeliads (Schwartz and Hen-



MAP. Distribution of *Sphaerodactylus vincenti*; the type-locality of the nominate subspecies and of *S. v. monilifer* on Dominica are too imprecise to plot; other type-localities are marked with circles, additional localities are marked with dots; the range outline for *S. v. monilifer* on Dominica

derson, 1991), but appear to be restricted to relatively mesic situations (Steinberg et al. 2007).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Overviews include Schwartz and Henderson (1991). Additional literature pertaining to this species is arranged by topic: **behavior** (Marcum et al. in press; *S. v. vincenti* on St. Vincent); **comparisons** (with *S. kirbyi* Hite et al. 2007, Lazell 1994); **diet** (Steinberg et al. 2007, *S. v. vincenti* on St. Vincent); **population densities** (Leclair and Provencher 1988, *S. v. psammius* on Martinique; Steinberg et al. 2007, *S. v. vincenti* on St. Vincent); **systematics** (Hass 1996), and **water loss rates** (Leclair 1978, *S. v. psammius* on Martinique; Steinberg et al. 2007, *S. v. vincenti* on St. Vincent).

The species is included in additional general works, checklists, guides, and keys (some may include brief descriptions) by Barbour (1914, 1930, 1935, 1937), Breuil (2002), Censky and Kaiser (1999), Corke (1987), Frank and Ramus (1995), Henderson and Powell (1999), Kluge (1991, 1995, 2001), Lorvelec et al. (2007), MacLean et al. (1977), Malhotra and Thorpe (1999), Mallery et al. (2007), Powell and Henderson (2007), Powell et al. (1996), Ricklefs and Lovette 1999, Schwartz (1973), Schwartz and Henderson (1985, 1988, 1991), Schwartz and Thomas (1975), Sokolov (1988), Underwood (1962), Wermuth (1965), and Williams (1999).

• **ETYMOLOGY.** The specific epithet, *vincenti*, refers to the island of St. Vincent, the type-locality of the species. The origins of the subspecific names are: *adamasi* presumably is from the Greek, meaning 'diamond,' probably a reference to the type-locality of this taxon; *diamesus* presumably is from the Greek ΔΙΑΜΕΣΟΥ, meaning 'between,' probably in reference to the fact that this subspecies is found on St. Lucia, between the Martinique populations to the north and the nominate subspecies to the south; *festus* is from the Latin, meaning 'joyful,' in reference to the fact that the holotype was collected on Independence Day (4 July 1914); *josephinae* is a matronym honoring Joséphine de Beauharnais, Martinique's most famous historical figure (Schwartz 1965); *monilifer* is from the Latin 'monile' (= necklace), presumably in reference to the prominent scapular ocelli in males; *pheristus* is from the Greek, meaning 'quick in action,' presumably a reference to the liveliness of these geckos; *psammius* presumably is from the Greek, meaning 'on the sand,' possibly a reference to the substrate where lizards were collected; and *ronaldi* is a patronym for Ronald F. Klinikowski, co-collector of the holotype (Schwartz 1965).

• **COMMENT.** The date of collection of the type series of *S. vincenti* is unknown, but the original BMNH registration numbers are 90.11.25.2–3 and 91.6.2.1–10, indicating that the specimens were originally accessioned in the BMNH collection in 1890 and 1891. The specimens are recorded as having been collected by H.H. Smith and presented by F.D. Godman (C. McCarthy, BMNH, *in litt.*, 3.I.2007).

In light of the high level of island bank endemism in the Lesser Antilles (e.g., Censky and Kaiser 1999) and the extreme variability of populations currently recognized as distinct at the subspecific level, further research may very well reveal several full species within what is now known as *S. vincenti*.

1. *Sphaerodactylus vincenti vincenti* Boulenger

Sphaerodactylus vincenti Boulenger 1891:354. See species synonymy.

Sphaerodactylus vincenti vincenti: King 1962:33.

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 17; Schwartz 1965): maximum known SVL to 29 mm in males and females; dorsal scales keeled, small, granular, numbering 41–51 from axilla to groin; ventral scales smooth, rounded, numbering 26–36 from axilla to groin; gulars keeled; chest scales smooth; midventral caudal scales expanded transversely into smooth plates; supralabials to center of eye 3; fourth toe lamellae 8–10; and escutcheons 21–31 scales wide and 4–6 scales long.

No sexual dichromatism is evident. Dorsal ground color is dark brown, without any pattern or with obscure tiny, dark flecks; venter is heavily stippled with brown; head is dull yellow, with color continuing ventrally onto the chin and throat; throat with a vague,

dark brown, linear pattern; iris pale bluish-green; suprapostorbital lines present in juveniles but extremely faint to absent in adults; no ocelli; ventral surface of tail dull red, especially prominent in juveniles; and sacral V present in juveniles but may disappear in some adults.

2. *Sphaerodactylus vincenti adamas* Schwartz

Sphaerodactylus vincenti adamas Schwartz 1965: 397. Type-locality, "Rocher de Diamant, Martinique." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 77130, an adult male collected on 27 March 1963 by R. Thomas (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 17; Schwartz 1965): maximum known SVL to 28 mm in males and 27 mm in females; dorsal scales keeled, small, not imbricate, numbering 29–39 from axilla to groin; ventral scales smooth, rounded, imbricate, numbering 26–32 from axilla to groin; midbody scale rows number 44–50; gular scales weakly keeled to smooth; midventral caudal scales smooth and laterally expanded; internasals 0–3; supralabials to center of eye 2–4; fourth toe lamellae 8–11; and escutcheons 6 scales wide and 27 scales long.

No sexual dichromatism is evident. Dorsal color is yellowish-tan to dark brown with coalesced dark brown markings over entire back; ventral color gray, with no yellow on throat; head and neck with a few dark specks; iris blue-gray; pattern of limbs marbled with dark brown; dorsum of tail tan with prominent sacral V and two caudal chevrons, underside of tail gray; and a slightly paler nuchal collar bordered anteriorly and posteriorly by a dark brown transverse line. In addition to the prominent collar, juveniles have three dorsal transverse crossbands, the anteriormost persisting in the pattern of some adults.

3. *Sphaerodactylus vincenti diamesus* Schwartz

Sphaerodactylus vincenti diamesus Schwartz 1965: 404. Type-locality, "Vigie Beach, Castries Quarter, St. Lucia." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 77075, an adult male collected on 31 March 1963 by R. Thomas (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 5 plus the holotype; Schwartz 1965): maximum known SVL to 28 mm in males, and to 29 mm in females; dorsal scales small, keeled, not imbricate, numbering 32–36 from axilla to groin; ventral scales round, smooth, imbricate, numbering 27–31 from axilla to groin; midbody scale rows number 46–50; gulars keeled; midventral caudal scales smooth and laterally expanded; internasals 1–2; supralabials to center of eye 3–4; fourth toe lamellae 9–11; and escutcheons are 3 scales wide and 24 scales long.

No sexual dichromatism is evident. Dorsal color is

yellowish-tan and stippled with tiny brown dots; ventral ground color pinkish-gray; head slightly more yellowish than dorsum; iris pale blue; throat pink and unpatterned; tail dull brown above and below; a faint pale nuchal bar barely outlined anteriorly and posteriorly; sacral V present but faint; and suprapostorbital lines prominent in juveniles but absent in adults.

4. *Sphaerodactylus vincenti festus* Barbour

Sphaerodactylus festus Barbour 1915:73. Type-locality, "Martinique," restricted to "Fort-de-France, Martinique" by Barbour (1921). Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 10622, an adult female collected on 4 July 1914 by A.G. Ruthven (not examined by authors). *Sphaerodactylus vincenti festus*: King 1962:30.

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 15; Schwartz 1965; note that the description of *S. v. festus* is mislabeled in Schwartz's paper as *S. v. josephinae*): maximum known SVL to 31 mm in both sexes; dorsal scales keeled, small, granular, numbering 40–54 from axilla to groin, no well-defined middorsal area of granules, but middorsal scales are reduced in size; ventral scales smooth, rounded, numbering 28–36 from axilla to groin; midbody scale rows number 54–61; gular scales are keeled, chest scales are smooth; midventral caudal scales smooth and laterally expanded; internasals 1–2; supralabials to center of eye 3; fourth toe lamellae 9–11; and escutcheons 5–6 scales wide and 19–27 scales long.

No sexual dichromatism is evident, "except in fine details" (Schwartz 1965). Dorsal color is tan, with heads distinctly yellow in both sexes. Black ocelli may be discrete and enclose a white (males) or gray (females) dot, or they may join across the back into a band that can enclose up to seven light dots. A dorsal pattern of dark brown marbling may be broken into dots or spots. Indistinct pale suprapostorbital lines join at the midline of the neck in some individuals, and is more prominent in juveniles. A sacral V usually is prominent. The tail is dull brown above, often with pale chevrons (if unregenerated) and dull orange beneath. The throat is deep yellow to deep orange in males and yellow to gray in females, occasionally with faint gray longitudinal stripes.

• **REMARKS.** One specimen (AMNH 100453) from Balata-Tourtet on the southern slopes of the Pitons du Carbet, Martinique, may be intermediate between *S. v. pheristus* and *S. v. festus*, suggesting that the two taxa may intergrade in that area (Schwartz 1965).

5. *Sphaerodactylus vincenti josephinae* Schwartz

Sphaerodactylus vincenti josephinae Schwartz 1965: 395. Type-locality, "Habitation Dizac, 1.5 km W. Le Diamant, Martinique." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 77077, an adult male collected on 27 March 1963 by A. Schwartz (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 23; Schwartz 1965): maximum known SVL to 29 mm in males and 28 mm in females; dorsal scales keeled, small, not imbricate, numbering 31–39 from axilla to groin; ventral scales smooth, imbricate, round, numbering 26–33 from axilla to groin; midbody scale rows number 46–56; gulars keeled to smooth (if smooth, at least a few scales with weak keels); chest scales smooth; midventral caudal scales smooth and laterally expanded; internasals 1–3; supralabials to center of eye 3; fourth toe lamellae 8–11; and escutcheons 18–25 scales wide and 3–6 scales long.

No sexual dichromatism is evident, except in fine details. Dorsal color is yellowish-tan to dark brown with darker brown marbling or spotting. Heads have a yellowish wash, less obvious in females. The throat is immaculate, pale yellow in males and yellowish-gray in females. The venter is more or less heavily stippled with brown. A pair of transverse brown scapular lines encloses a slightly paler tan area, thus forming a faint collar. The collar may be bordered on each side by an additional brown line, for a total of 4 dark transverse lines on the neck and shoulders. A V-shaped head pattern is most prominent in juveniles. A sacral V or Y is usually present. The dorsal ground color extends onto the tail, generally with paler chevrons at least basally. The iris is blue.

6. *Sphaerodactylus vincenti monilifer* Barbour

Sphaerodactylus monilifer Barbour 1921:271. Type-locality, "Dominica." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 10786, a subadult male collected by G.A. Ramage, purchased from G.A. Ramage in September 1888 and received in exchange by the MCZ from the British Museum in 1915 (not examined by authors).

Sphaerodactylus vincenti monilifer. Schwartz 1965: 405.

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 6; Barbour 1921, Schwartz 1965): maximum known SVL to 32 mm in males and females; dorsal scales keeled, small, granular, numbering 39–44 from axilla to groin; no well-defined middorsal area of granules, but mid-dorsal scales are reduced in size; ventral scales smooth and round, numbering 30–35 from axilla to groin; scale rows around midbody number 47–51; gulars and chest scales keeled; midventral row of caudal scales expanded transversely into smooth plates; internasals 1–3; supralabials to center of eye 3–4; fourth toe lamellae 9–10; and escutcheon 28–32 scales wide and 8–9 scales long.

Sexual dichromatism is evident. Dorsal ground color of males is brown, with two black ocelli surrounding a gray dot, and the remainder of the dorsum variably marbled with dark brown. Prominent suprapostorbital lines are outlined on both sides with black and extend posteriorly to between the ocelli. The throat is dull yellow stippled with brown; ventral ground color

dull yellow and stippled with gray or brown. Females lack ocelli, but have scapular spots lateral to the suprapostorbital lines. The throat and venter are dull yellow and stippled with brown to gray. A sacral V is present, the tail has dorsal chevrons, the underside of the tail is orange, and the iris is brown in both sexes.

7. *Sphaerodactylus vincenti pheristus* Schwartz

Sphaerodactylus vincenti pheristus Schwartz 1965: 395. Type-locality, "6 km SW Ajoupa-Bouillon, Martinique." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 77074, an adult male collected on 28 March 1963 by A. Schwartz and R. Thomas (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 11; Schwartz 1965): large size, with maximum known SVL to 40 mm in both sexes; dorsal scales strongly keeled, very small, not imbricate, numbering 52–63 from axilla to groin; ventral scales strongly keeled, imbricate, numbering 34–40 from axilla to groin; scale rows around midbody number 63–75; midventral caudal scale row smooth and laterally expanded; internasals 0–2; supralabials to center of eye 3–4; fourth toe lamellae 9–13; and escutcheons 8–10 scale rows wide and 33–36 scale rows long.

Sexual dichromatism is evident. Dorsal ground color in males is tan to very dark brown with a pattern of brown rosettes. The venter is dark gray to almost black. Head with a faint orange hue. The throat is yellow to deep yellow-orange with brown stippling. A pair of large black ocelli with white centers is present on the shoulders. The iris is grayish-blue. Ventral color varies from almost black to dark gray. Ocelli are discrete and white centered. A sacral V is present or absent. The throat is yellow to deep yellow-orange and usually patternless. The underside of the tail ranges from black to orange. The dorsum in females is brown with irregular dark and light markings yielding a "camouflage" pattern. Ventral color is grayish-pink. The throat is tan with a vague darker brown pattern as in males. Ocelli are complete or open posteriorly with tan centers. Prominent suprapostorbital stripes extend behind and between the ocelli onto the scapular region, and may be indicated posteriorly as a pale median band on the anterior of the trunk and enclosing a marbled pale area covering much of the posterior surface of the head. A sacral V is present and clearly defined. The underside of the tail is orange.

• **REMARKS.** This subspecies intergrades with *S. v. ronaldi* along the northern coast of Martinique (Schwartz 1965).

8. *Sphaerodactylus vincenti psammius* Schwartz

Sphaerodactylus vincenti psammius Schwartz 1965: 398. Type-locality, "5 km south of Ste[.]Anne, Grande Arise des Salines, Martinique." Holotype,

Museum of Comparative Zoology, Harvard University (MCZ) 77064, an adult male collected on 21 March by A. Schwartz and R. Thomas (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 25; Schwartz 1965): maximum known SVL to 28 mm in males and 27 mm in females; dorsal scales keeled, small, not imbricate, numbering 33–47 from axilla to groin; ventral scales round, smooth, imbricate, numbering 28–33 from axilla to groin; scales around mid-body number 52–67; gular scales keeled; midventral caudal scales smooth and laterally expanded; internasals 1–3; supralabials to center of eye 2–3; fourth toe lamellae 8–11; and escutcheon 5–7 scales wide and 19–28 scales long.

No sexual dichromatism is evident. Dorsal ground color is pale to yellowish-tan, with or without a pattern of isolated vermiculoid dots from upper sides of the head over the entire dorsum and including the basal portion of the tail, which lacks a sacral V. The chin and throat are yellow. The tail is tan above and usually patterned with chevrons. The underside of the tail is pale orange. The iris is blue.

9. *Sphaerodactylus vincenti ronaldi* Schwartz

Sphaerodactylus vincenti ronaldi Schwartz 1965:399. Type-locality, "Château Dubuc, 3 km NE Tartane, Martinique." Holotype, Museum of Comparative Zoology, Harvard University (MCZ) 77089, an adult male collected on 30 January 1962 by R.F. Klinikowski and A. Schwartz (not examined by authors).

• **DEFINITION.** This subspecies is characterized by the following combination of characters (N = 35; Schwartz 1965): maximum known SVL in males and females is 32 mm; dorsal scales keeled, small, not imbricate, numbering 41–57 from axilla to groin; ventral and chest scales round, smooth, imbricate, numbering 29–37 from axilla to groin; scales around mid-body number 57–66; gular scales keeled; midventral caudal row smooth and laterally expanded; internasals 1–2; supralabials to center of eye 3–4; fourth toe lamellae 8–11; and escutcheon 6–9 scales wide and 24–32 scales long.

Sexual dichromatism is moderate. Male dorsal ground color is purplish-brown with dark brown rosettes evenly scattered to give the appearance of a reticulum. A pair of large black ocelli have white centers, and are most prominent in juveniles. The head is yellowish-brown, the throat a deep orange-yellow-brown, often with some dark brown stippling. The venter is pale purplish and the underside of the tail is yellow. Suprapostorbital lines are present in females and absent in males. A sacral V is evident (absent or obscured by rosettes in males). The underside of the tail in females is reddish. Juveniles are patterned like females. The iris is pale blue in both sexes.

• **REMARKS.** This subspecies intergrades with *S. v.*

pheristus as far south as 5 km SE Basse-Pointe (Schwartz 1965). One specimen (AMNH 100453) from Balata-Tourtet, on the southern slopes of the Pitons du Carbet, Martinique, may be intermediate between *S. v. pheristus* and *S. v. festus*, suggesting that the two taxa may intergrade in that area.

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