

Catalogue of American Amphibians and Reptiles.

Williamson, K.E. and R. Powell. 2004. *Gymnophthalmus underwoodi*.

Gymnophthalmus underwoodi Grant

Gymnophthalmus lineatus: Underwood 1956:25 (part).

Gymnophthalmus underwoodi Grant 1958:228. Type locality, "Barbados, B.W.I." Holotype, University of Illinois Museum of Natural History (UIMNH) 42334, adult female, collected by C. Grant, January 1957 (not examined by authors).

Gymnophthalmus underwoodii: Hoogmoed and Lescure 1975: 163.

Gymnophthalmus pleei: Brooks 1983:31 (part).

Gymnophthalmus speciosus: Vanzolini 1990a:96 (part).

• **CONTENT.** No subspecies are recognized.

• **DEFINITION.** *Gymnophthalmus underwoodi* is a small, diploid, parthenogenetic lizard with a maximum known SVL of 44 mm (Hoogmoed 1973; but see **Remarks**). The head is small, pyramidal, 1.5 times as long as wide, slightly depressed, and as wide as the neck, which is as wide as the body. The body and tail are cylindrical. Legs are short and the inner finger is absent. Femoral pores are absent. Dorsal scale rows at midbody number 13, dorsal body scales from parietal to base of the tail are 31–34, ventral scales from pectoral plates to anal (cloacal) shield are 21–23. Dorsal body scales are smooth, but posterior dorsal caudal scales are strongly keeled. Head scales bear numerous pits but are otherwise smooth. A pair of hexagonal prefrontals form a short median suture and are larger than the rhomboidal frontal. Frontoparietals are absent. The interparietal is long and larger than the parietals. A row of three occipitals is present. One large supraocular is in contact with the two supraciliaries. The transparent lower eyelid is grown over the eye and is immovable. The bifid tongue is lanceolate and without emargination; rhomboidal, scale-like, imbricate papillae cover the tongue in oblique rows.

Dorsal ground color is shiny bronze-brown. Pale lines extend from the snout over the eyes to above the forelegs along the junction of the bronze back and the darker sides. Black lateral stripes begin at the snout and continue onto the tail. The venter is whitish but heavily marked with dark gray to black. The chin and throat are off-white, and the posterior portion of the tail is off-white with dark smudging (Schwartz and Henderson 1991).

• **DIAGNOSIS.** *Gymnophthalmus underwoodi* can be distinguished from sympatric congeners in northern South America by its lack of femoral pores, a red-orange tail (present in *G. speciosus*), and distinct lateral stripes (present in *G. lineatus*) (Hoogmoed 1973). However, Brazilian populations cannot be consistently diagnosed and may represent taxa distinct from those to the north (Avila-Pires 1995, see also **Remarks**). The species may be distinguished from its only congener on the Trinidadian Archipelago by the lower number of ventrals (23–27 in *G. speciosus*; Murphy 1997) and from its only West Indian congener by its smaller size (maximum SVL in *G. pleei* = 48 mm), fewer dorsal scale rows (17–19 in *G. pleei*), fewer scales between pectoral plates and anal shield (23–31, usually 25–28, in *G. pleei*), absence of femoral pores, and lack of two golden yellow canthal stripes (Schwartz and Henderson 1985).

• **DESCRIPTIONS.** In addition to the original by Grant (1958), detailed descriptions are in Breuil (2002), Cunha (1981, but see



FIGURE 1. Adult *Gymnophthalmus underwoodi* from Grenada.

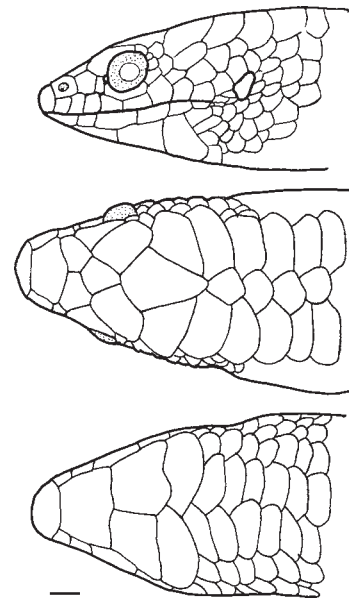


FIGURE 2. *Gymnophthalmus underwoodi* (RMNH 15245 c) from Paramaribo, Suriname; bar = 1 mm (modified from Hoogmoed 1973).

Remarks), Hoogmoed (1973), Murphy (1997), Schwartz and Henderson (1991), and Thomas (1965).

• **ILLUSTRATIONS.** **Color photographs** are in Breuil (2002), Gasc (1990), Murphy (1997), Pianka and Vitt (2003), and Powell et al. (1996). **Black and white photographs** are in Boos (1979), Cole et al. (1990, 1993), Hoogmoed (1973), and Vazolini and de Carvalho (1991). Hardy et al. (1989) included black and white photographs of reproductive tissues. A **color drawing** is in Fitzgerald (2003). **Line drawings** are in Breuil (2002), Currat (1980), and Hoogmoed (1973).

An illustration of a Barbadian stamp with a color illustration of *G. underwoodi* is in Fraser et al. (1990). Cole et al. (1989, 1990) provided illustrations of the karyotype and the latter also illustrated representative habitat. Color photographs of habitat are in Breuil (2002). Yonenaga-Yassuda et al. (1995) included black-and-white photographs of karyotypes.

A color photograph and line drawings of an individual in the *G. underwoodi* complex (see **Remarks**) are in Avila-Pires (1995). The presence of femoral pores indicated in the line drawings precludes that individual from being *G. underwoodi* (*sensu stricto*).

• **DISTRIBUTION.** The species has a mosaic distribution in northern South America (Vanzolini 1978), where it is native to **Guyana** (Hoogmoed and Lescure 1975), **Suriname** (Hoogmoed 1973), **Venezuela** (Gorzula and Señaris 1998, Pefaur 1992), **Brasil** (Cunha 1981, Vanzolini 1976, 1988, but see also **Remarks**), and possibly **Colombia** (see **Comments**).

The species is known to occur on **Trinidad** (Boos 1979, 1984c; Murphy 1997; Underwood 1956, as *G. lineatus*, 1962) and may occur on Tobago (Hardy 1982, Mertens 1972). Its presence on the latter has never been confirmed (Murphy 1997), although Lever (2003) lists Tobago as being within the species' "natural distribution." The species has been found on offshore islands in the Trinidadian Archipelago (The Cotorras, Boos 1990; Gaspar Grande Island, Boos and Quesnel 1994; possibly on Monos Island, Boos 1984a,b). Underwood (1962) and Boos (1984b) also listed Chacachacare Island, but that population has since been shown to be *G. speciosus* (Murphy 1997).

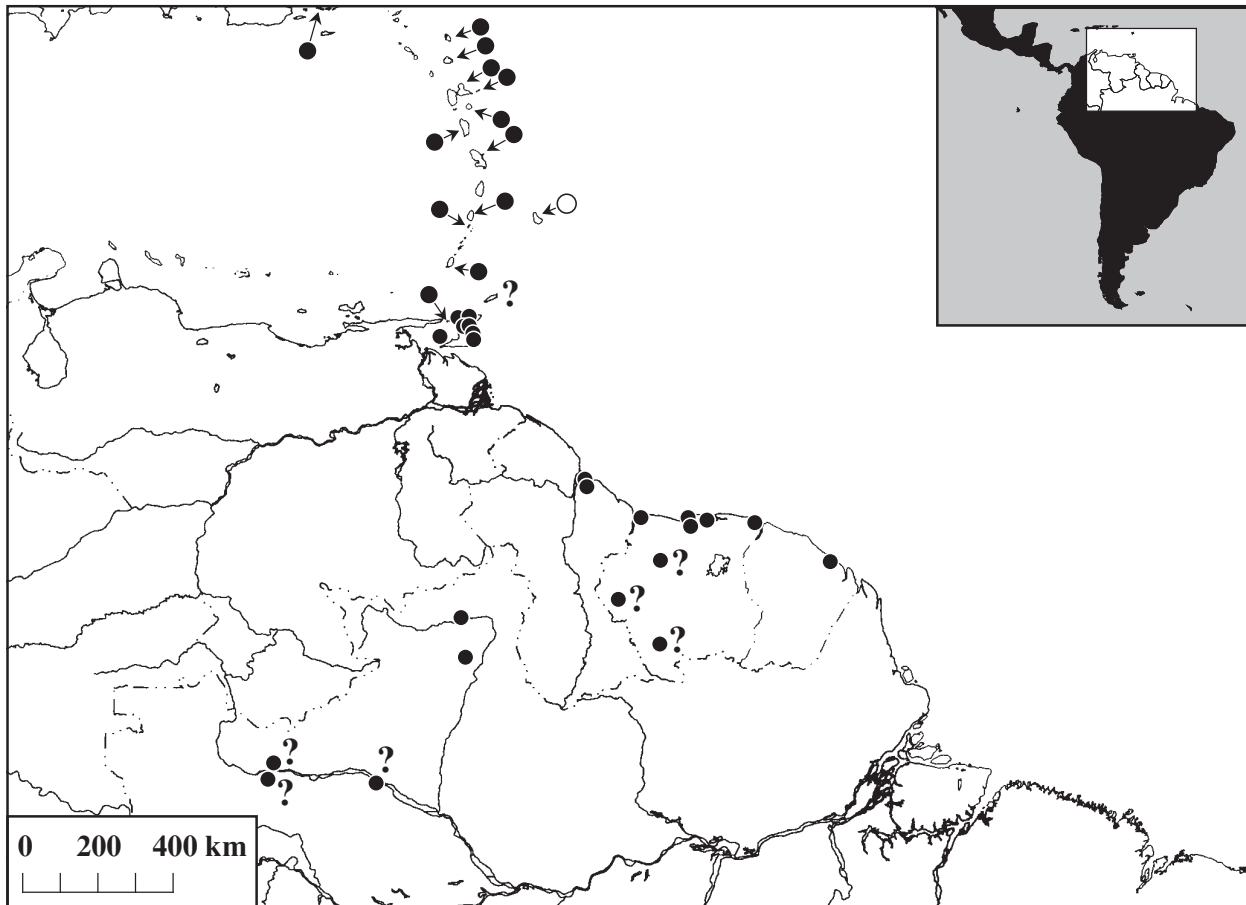
In the West Indies the species is known to occur on **Barbados** (Grant 1958, Fraser et al. 1990), **St. Vincent** (including Chateaubelair; possibly introduced, Schwartz and Henderson 1988, Schwartz and Thomas 1975), the **Grenadines** (Bequia, Lazell and Sinclair 1990), and **Grenada** (Hardy 1982; Vanzolini

1990a, as *G. speciosus*; Hog Island, Williamson et al. 2002). Presumably introduced populations are known from **Antigua** (Powell and Lindsay 1999), **Barbuda** (Censky and Lindsay 1997), **Dominica** (Breuil 2002; Brooks 1983, as *G. pleei*; Vanzolini 1990b; but possibly extirpated, Corke 1992, Malhotra and Thorpe 1999), and **Guadeloupe** (both Grande-Terre and Basse-Terre and including La Désirade, Breuil 2002; Schwartz and Henderson 1985, 1988; Schwartz and Thomas 1975; Vanzolini 1990b), **Marie-Galante** (Breuil 2002), and **Martinique** (Breuil 2002). Cole et al. (1990) reported the presence of the species on **St. Thomas**, U.S. Virgin Islands.

The species' South American distribution was illustrated in Avila-Pires (1995), Cole et al. (1989, 1990), Hoogmoed (1973), and Vanzolini and Carvalho (1991). The Trinidadian range was shown by Murphy (1997) and the West Indian range was illustrated in Breuil (2002), Hedges (1996a), and Schwartz and Henderson (1991).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** References to *Gymnophthalmus underwoodi* are arranged by topic (in some instances, allusions to this species were included in more general studies): **diet** (Caldwell and Vitt 1999), **distribution** (Censky and Kaiser 1999, Corke 1992, Cuellar 1977, Murphy 1996, see also **Distribution**), **ecological relationships** (Breuil 2002, Vitt and Zani 1998), **evolutionary origin and phylogenetic relationships** (Avila-Pires 1995; Benozzati and Rodrigues 2003; Censky



MAP. Distribution of *Gymnophthalmus underwoodi* (modified in part from Breuil 2002, Schwartz and Henderson 1991, and Avila-Pires 1995): the circle marks the type locality and dots or dots and arrows indicate other records. Question marks denote the uncertainty regarding the presence of the species on Tobago or, on the South American mainland, mark all-female populations or populations in which the reproductive mode is unknown and which may represent "cryptic" species in the *G. underwoodi* complex (*sensu* Avila-Pires 1995). Range outlines are not provided due to the disjunct nature of the species' distribution.

and Kaiser 1999; Cole 1994; Cole et al. 1983, 1989, 1990, 1993; Dessauer and Cole 1993; Gorman et al. 1971; Hoogmoed et al. 1992; Kizirian and Cole 1999; Martins 1991; Murphy 1996; Pellegrino et al. 2001; Presch 1980; Thomas 1965; Vanzolini and Carvalho 1991; Yonenaga-Yassuda et al. 1995; see also **Remarks**), **functional morphology** (MacLean 1974), **geographic variation** (Vanzolini and Carvalho 1991), **geographic origin** (Hedges 1996a,b), **predation** (Voous 1969, see also **Comments**), **reproduction** (Breuil 2002; Cole 1975, 1994; Cuellar et al. 1977; Vanzolini 1976; Hardy et al. 1989), and **right-side dominance and injury rates** (Seligmann et al. 2003).

This species is included in **general works, guides, checklists, keys, or notes** (some of which include brief descriptions and comments on parthenogenesis) by Boos (1979, 1984a,b,c, 1990), Breuil (2002, 2003), Censky (2003), Censky and Kaiser (1999), Corke (1992), Cunha (1981, but see **Remarks**), Currat (1980), Darvensky et al. (1985), Fitzgerald (2003), Frank and Ramus (1995), Gasc (1990), Germano et al. (2003), Grant (1959), Hardy (1982), Hoogmoed (1973), Hoogmoed and Lescure (1975), Lescure (1987), Lever (2003), MacLean et al. (1977), Malhotra and Thorpe (1999), Maslin (1971), Mertens (1972), Murphy (1997), Obst et al. (1984), O'Shea (1989, probably in reference to the *G. underwoodi* complex; see **Remarks**), Pefaur (1992), Peters and Donoso-Barros (1970), Powell et al. (1996), Rodrigues (1991) Schwartz and Henderson (1985, 1988), Schwartz and Thomas (1975), Summers (1984), Underwood (1962), Vanzolini (1988), and Vrijenhoek et al. (1989). See also **Comments**.

• **REMARKS.** After Thomas (1965) first recognized that *G. underwoodi* from the West Indies was parthenogenetic, Hoogmoed (1973) concluded that populations in Suriname also were all-female. Vanzolini (1976) found males in some populations from Brasil, but Hardy et al. (1989) concluded that these represented closely related cryptic species.

Cole et al. (1983) found high levels of heterozygosity and proposed a hybrid origin for *G. underwoodi*, with *G. speciosus* and *G. pleei* as parental species. However, Cole et al. (1989) eliminated the hypothesis that *G. pleei* was one of the parental species, and suggested instead that an undescribed species had hybridized with *G. speciosus*. Dessauer and Cole (1989) proposed that hybridization had occurred in ecotonal areas that had shifted as a consequence of habitat shifts during the Pleistocene.

Presch (1980) listed four historic assemblages, some of which may refer to related taxa. For example, Cunha (1981) provided dorsal and ventral scale counts of specimens for Roraima (Brasil) that exceed the numbers associated with *G. underwoodi* as currently defined, and Vanzolini and Carvalho (1991) indicated that the lineage of *G. underwoodi* from Roraima was karyotypically distinct from that inhabiting Trinidad and Suriname (e.g., Cole et al. 1990). Martins (1991), using allozyme analysis, found low levels of heterozygosity and Yonenaga-Yassuda et al. (1995) noted no chromosomal heteromorphisms. Benozzati and Rodrigues (2003), using mtDNA analyses, suggested that Brazilian population did not arise as a consequence of hybridization between sympatric *G. leucomystax* and *G. vanzoi* and, in fact, was distinctive at levels comparable to some intergeneric distances among microteiid lizards. These data suggest that *G. underwoodi*, as currently defined, undoubtedly represents a complex of species (e.g., Pianka and Vitt 2003), all probably of hybrid origins, but not necessarily from the same parental stocks.

Avila-Pires (1995) and Gorzula and Señaris (1999) treated close relatives of *G. underwoodi* (*G. cytus*, *G. leucomystax*, *G. speciosus*, *G. underwoodi*) as the "*G. underwoodi* complex," which apparently includes distinct, but "cryptic" species, some of them bisexual.

O'Shea (1989) included *G. underwoodi* in a species list for Ilha de Maracá in northern Brasil, but was undoubtedly referring

to another member of the complex, because he mentioned SVLs as 60–70 mm.

Boos (1979) gave the common name in Trinidad as "Shiny Lizard." Frank and Ramus (1995) used "Underwood's Spectacled Tegu" as a common name applicable to this species. S.B. Hedges (in Caribherp, a web resource on West Indian amphibians and reptiles, <http://evo.bio.psu.edu/caribherp/>) used "Smooth-scaled Worm Lizard." Pianka and Vitt (2003) noted that the Yanomamö of Roraima (Brasil) had common names for four gymnophthalmid lizards known from the area, that for *G. underwoodi* was *hare-mukeruk* (using Portuguese phonetic spelling).

• **ETYMOLOGY.** The name *underwoodi* is a patronym honoring Garth Underwood, "in recognition of his work on West Indian herptiles" (Grant 1958).

• **COMMENTS.** Because of uncertainties regarding the phylogeny and status of some populations of *G. underwoodi*, as currently recognized, some of the literature cited may actually refer to populations that will be determined to be distinct (see **Remarks**). Conversely, some published information overtly applicable to other species of *Gymnophthalmus* may refer, at least in part, to *G. underwoodi*. In addition, some literature references that addressed gymnophthalmids prior to the description of *G. underwoodi* may apply to that species, particularly since parthenogenesis in lizards was not known at the time.

The EMBL Reptile Database (www.embl-heidelberg.de/~uetz/LivingReptiles.html) cites F. Castro (pers. comm.), noting that this species is found in Colombia.

Voous (1969) indicated that Roadside Hawks (*Buteo magnirostris*) prey on *Gymnophthalmus* sp. in coastal districts of Suriname. Due to small size and local abundance, these lizards undoubtedly serve as at least occasional prey for a diverse suite of saurian, ophidian, avian, and mammalian predators.

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