



First Record of Vertebrate Predation by the Cuban Whiptail, *Pholidoscelis auberi zugii* (Squamata: Teiidae), with a Summary of Reptilian and Amphibian Prey of West Indian Whiptails

Aslam I. Castellón Maure and Tomás M. Rodríguez-Cabrera

Sociedad Cubana de Zoología, Cuba (aslam870@gmail.com; toasmichel.rodriguez@gmail.com)

The West Indian lizard genus *Pholidoscelis* (Teiidae) comprises 20 extant species (Uetz et al. 2018). Forty currently recognized subspecies of the Cuban Whiptail (*P. auberi*) are distributed across the Cuban Archipelago (28 subspecies) and the Great Bahama Bank (12 subspecies), and the taxonomic determinations of some populations are still pending (McCoy 1970; Schwartz 1970a, 1970b; Garrido 1975; Gali and Garrido 1986; Buckner et al. 2012; Estrada 2012; Torres et al. 2014; Goicoechea et al. 2016). *Pholidoscelis auberi*, as currently defined, almost certainly represents a species complex (Henderson and Powell 2009). However, despite its abundance and wide distribution, little is known about the feeding habits of this species. The only dietary information is in Gundlach (1880), who mentioned that these lizards eat insects, and Barbour and Ramsden (1919), who observed them “picking up ants.” Herein we report the first instance of predation on a vertebrate by *P. auberi*.

At 1905 hours on 14 December 2015, we observed an adult *Pholidoscelis auberi zugii* (SVL ca. 80 mm) preying on a Cuban Flat-headed Frog (*Eleutherodactylus planirostris*, Eleutherodactylidae) at Bernabé’s house (22°19’34”N, 81°11’01”W; 3 m asl; WGS 84), a popular birdwatching site in Pálpite, Ciénaga de Zapata Municipality, Matanzas Province, Cuba. When first observed, the frog appeared to be dead and the lizard had bitten the anterior region of its body (Fig. 1A). The lizard repeatedly changed its hold, shaking the prey, and apparently seeking a better position for swallowing it (Figs. 1B & 1C). After a few minutes the lizard ran away, carrying the frog out of our sight.

Pholidoscelis auberi zugii ranges across the southern mainland Matanzas Province (Zapata Swamp), Cayería de Diego Pérez, Cayos Blancos del Sur, and the Archipiélago de los Canarreos (except Isla de la Juventud; Fig. 2; Garrido 1980; Gali and Garrido 1986; Rodríguez and Rivalta 2007; Estrada



Fig. 1. Sequence of photographs of predation by a Cuban Whiptail (*Pholidoscelis auberi zugii*) on a Cuban Flat-headed Frog (*Eleutherodactylus planirostris*) at Pálpite, Zapata Swamp, Cuba. Photographs © Aslam I. Castellón Maure.

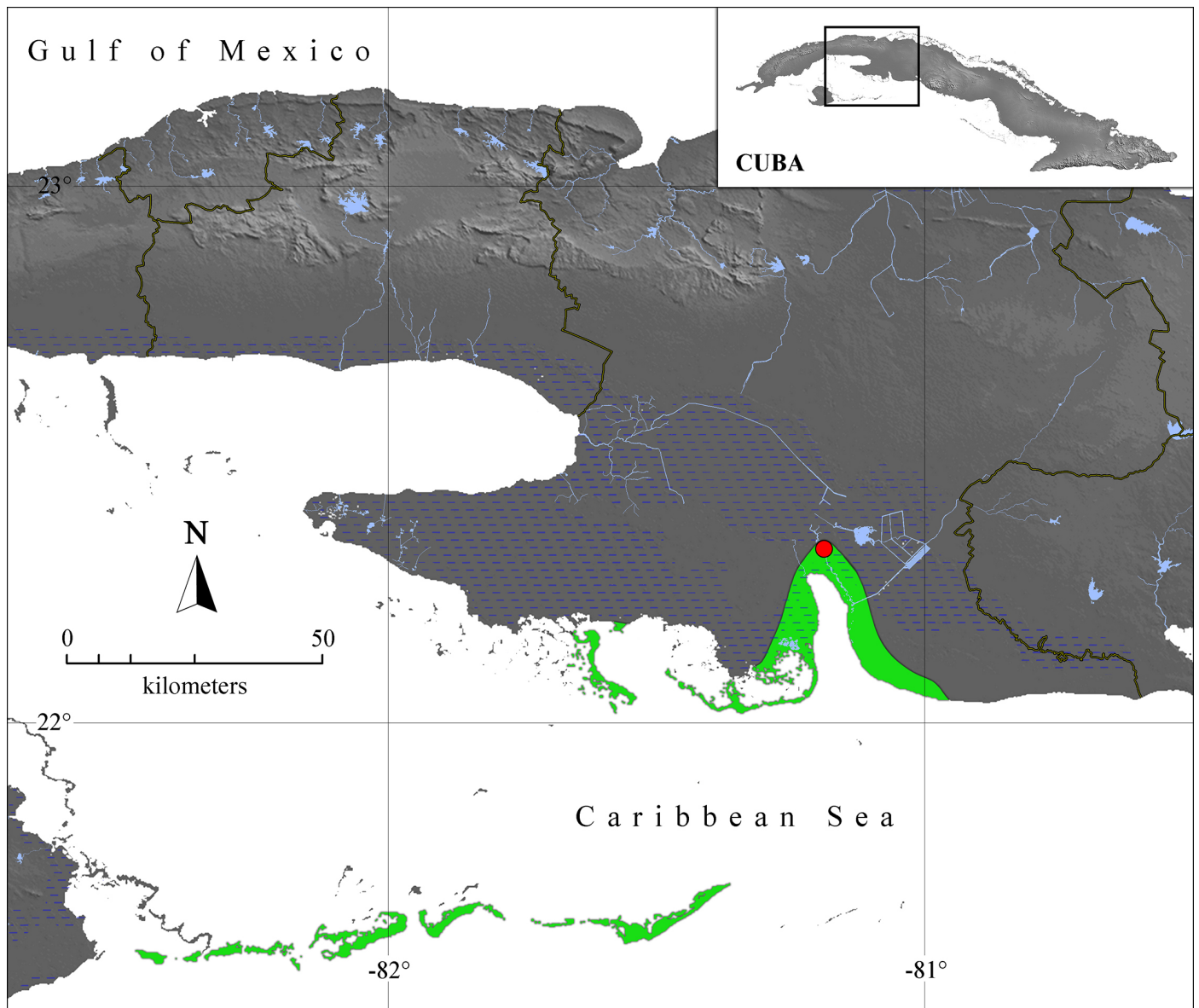


Fig. 2. Map with the distribution of *Pholidoscelis auberi zugii* (green) in southern Matanzas Province and the southern keys, with the red dot depicting the location of Pálpite, Zapata Swamp, where the predation event on *Eleutherodactylus planirostris* was observed. The dashed horizontal blue lines represent swampy areas.

2012). In the Zapata Swamp, it is relatively common along the coast between Playa Larga and Girón (M. Cañizares, pers. comm.). The site where we observed the predation event was at the northernmost point of the subspecies’ distribution (Fig. 2; Rodríguez and Rivalta 2007).

Nearly half of the species of *Pholidoscelis* are known to prey on vertebrates, particularly other lizards (Table 1), and other whiptails have been observed chasing anoles and small geckos (see Henderson and Powell 2009 for a review). Indeed, many species of anoles restrict spatial and temporal activity to periods when whiptails (and curlytails, genus *Leiocephalus*, another known predator) are unlikely to be active, apparently in an effort to avoid predation (see Henderson and Powell 2009 for a review). Therefore, the paucity of vertebrate prey in the diet of *P. auberi* appears to be an exception for the genus, not the rule.



Fig. 3. The Cuban Flat-headed Frog (*Eleutherodactylus planirostris*) is the only non-endemic eleutherodactylid frog in Cuba. Photograph © Raimundo López-Silvero.

Table 1. West Indian amphibians and reptiles confirmed as prey of whiptails in the genus *Pholidoscelis*. Abbreviations: E) eggs, H) hatchlings.

Predators	Prey	Islands	Sources
<i>Pholidoscelis auberi</i>	<i>Eleutherodactylus planirostris</i>	Cuba	This paper
<i>Pholidoscelis chrysolemus</i>	<i>Celestus agasepsoides</i>	Hispaniola	Schell et al. (1993), Sproston et al. (1999),
	<i>Anolis coelestinus</i>		Henderson and Powell (2009)
	<i>Anolis</i> sp. (E)		
	<i>Pholidoscelis</i> sp. (tail)		
<i>Pholidoscelis dorsalis</i>	<i>Pholidoscelis dorsalis</i>	Jamaica	Grant (1940)
<i>Pholidoscelis exsul</i>	<i>Anolis cristatellus</i> (tail)	Puerto Rico	Schmidt (1920, 1928), Lewis (1986, 1989),
	<i>Anolis monensis</i>	Isla Mona	Rivero and Seguí (1992), Stewart and
	<i>Anolis</i> sp. (E)		Woolbright (1996), Joglar (2005), K. de
	<i>Sphaerodactylus macrolepis</i>		Queiroz and J.B. Losos in Henderson and
	<i>Iguana iguana</i> (E)		Powell (2009), Ríos-López et al. (2015)
	<i>Eleutherodactylus coqui</i>		
	Treefrogs (indeterminate)		
<i>Pholidoscelis fuscatus</i>	<i>Iguana delicatissima</i> (E, H)	Dominica	Day et al. (2000), Breuil (2002), Knapp (2007),
	<i>Eretmochelys imbricata</i> (H)		Knapp and Price (2008), C.R. Knapp in
			Henderson and Powell (2009)
<i>Pholidoscelis griswoldi</i>	<i>Anolis watti</i>	Red Head Island	Smith and Baum (2000), Kolbe et al. (2008)
<i>Pholidoscelis plei</i>	<i>Anolis gingivinus</i>	Saint Martin	Censky (1996), Breuil (2002), Hodge et al.
	<i>Anolis pogus</i>	Tintamarre Island	(2003), Powell et al. (2005, 2015)
	<i>Anolis</i> sp. (E)		
	<i>Sphaerodactylus parvus</i>		
<i>Pholidoscelis polops</i>	<i>Sphaerodactylus beattyi</i> (E)	Saint Croix	Meier et al. (1993)
<i>Pholidoscelis</i> sp.	<i>Caiman crocodilus</i> (E)	Puerto Rico	Rivero (1998)

The frog genus *Eleutherodactylus* includes 58 Cuban species, of which *E. planirostris* (Fig. 3), although native, is the only non-endemic species (see Alonso and García 2017 for a review). The latter is a generalist species that occurs naturally in Cuba, the Cayman Islands, and the Bahama Islands. In addition, introduced populations are known from Jamaica, Grenada (although apparently extirpated; Henderson and Powell 2018), the Caicos Islands, the southeastern United States, Mexico, Honduras, the Miskito Cays of Nicaragua, Panama, and the Pacific islands of Hawaii and Guam (for reviews see Henderson and Powell 2009 and Cedeno-Vázquez et al. 2014). West Indian eleutherodactylid frogs are frequent

prey of a variety of predators (see Henderson and Powell 2009 for a review). However, few predators have been reported for *E. planirostris*; these include the Cuban Treefrog (*Osteopilus septentrionalis*, Hylidae) and three dipsadid snakes, *Cubophis cantherigerus*, *C. caymanus*, and *C. vudii* (Henderson and Sajdak 1996; Meshaka 1996; Alonso and Rodríguez 2003). *Pholidoscelis auberi* is the first lizard predator reported for *E. planirostris* and the second species of *Pholidoscelis* known to prey on an amphibian in the West Indies (*P. exsul* has been repeatedly reported preying on *E. coqui* in Puerto Rico (Table 1; Rivero and Seguí 1992; Stewart and Woolbright 1996; Joglar 2005).

Acknowledgements

We thank Maydiel Cañizares, Empresa Nacional para la Protección de la Flora y la Fauna, Ciénaga de Zapata, for providing useful information on the distribution and abundance of *Pholidoscelis auberi zugi* at the Zapata Swamp. We also thank Raimundo López-Silvero for allowing the use of his photograph. Finally, we acknowledge José (Pepé) Rodríguez and Felisa Collazo (Puerto Rico) for assistance in the field and logistical support during our trip to the Zapata Swamp.

Literature Cited

- Alonso [Bosch], R. and A. Rodríguez. 2003. Entre la hojarasca bajo nuestros pies, pp. 30–37. In: L. Rodríguez Schettino (ed.), *Anfibios y Reptiles de Cuba*. UPC Print, Vaasa, Finland.
- Alonso Bosch, R. and L.Y. García Padrón. 2017. Anfibios, pp. 348–375. In: C.A. Mancina and D.D. Cruz (eds.), *Diversidad Biológica de Cuba: Métodos de Inventario, Monitoreo y Colecciones Biológicas*. Editorial AMA, La Habana.
- Barbour, T. and C.T. Ramsden. 1919. The herpetology of Cuba. *Memoirs of the Museum of Comparative Zoology* 47: 71–213.
- Breuil, M. 2002. Histoire naturelle des amphibiens et reptiles terrestres de l'Archipel Guadeloupéen. Guadeloupe, Saint-Martin, Saint-Barthélemy. *Patrimoines Naturels, Paris* 54: 1–339.
- Buckner, S.D., R. Franz, and R.G. Reynolds. 2012. Bahama Islands and Turks & Caicos Islands, pp. 93–110. In: R. Powell and R.W. Henderson (eds.), *Island lists of West Indian amphibians and reptiles*. *Bulletin of the Florida Museum of Natural History* 51: 85–166.
- Cedeño-Vázquez, J.R., J. González-Vázquez, A. Martínez-Arce, and L. Canseco-Márquez. 2014. First record of the invasive Greenhouse Frog (*Eleutherodactylus planirostris*) in the Mexican Caribbean. *Revista Mexicana de Biodiversidad* 85: 650–653.
- Censky, E.J. 1996. The evolution of sexual size dimorphism in the teiid lizard *Ameiva plei*: A test of alternative hypotheses, pp. 277–289. In: R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. Society for the Study of Amphibians and Reptiles, Contributions to Herpetology, vol. 12, Ithaca, New York.
- Day, M., M. Breuil, and S. Reichling. 2000. Lesser Antillean Iguana: *Iguana delicatissima*, pp. 62–67. In: A. Alberts (ed.), *West Indian Iguanas: Status Survey and Conservation Action Plan*. International Union for Conservation of Natural Resources, Gland, Switzerland and Cambridge, UK.
- Estrada, A.R. 2012. The Cuban Archipelago, pp. 113–125. In: R. Powell and R.W. Henderson (eds.), *Island lists of West Indian amphibians and reptiles*. *Bulletin of the Florida Museum of Natural History* 51: 85–166.
- Garrido, O.H. 1975. Nuevos reptiles del archipiélago cubano. *Poeyana* 141: 1–158.
- Garrido, O.H. 1980. Los vertebrados terrestres de la Península de Zapata. *Poeyana* 203: 1–49.
- Gali, F. and O.H. Garrido. 1986. Two new subspecies of *Ameiva auberi* (Reptilia: Teiidae) from Cuba. *Caribbean Journal of Science* 22: 165–173.
- Goicoechea, N., D.R. Frost, I. de la Riva, K.C.M. Pellegrino, J. Sites, Jr, M.T. Rodrigues, and J.M. Padial. 2016. Molecular systematics of teioid lizards (Teioidea/Gymnophthalamoidea: Squamata) based on the analysis of 48 loci under tree-alignment and similarity-alignment. *Cladistics* 32: 624–671.
- Grant, C. 1940. The herpetology of Jamaica. II. The Reptiles. *Bulletin of the Institute of Jamaica, Science Series* 1: 61–148.
- Gundlach, J.C. 1880. *Contribucion a la Erpetología Cubana*. Imprenta de G. Montiel y Ca, La Habana.
- Henderson, R.W. and R.A. Sajdak. 1996. Diets of West Indian racers (Colubridae: *Alsophis*): Composition and biogeographic implications, pp. 227–338. In: R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. Society for the Study of Amphibians and Reptiles, Contributions to Herpetology, volume 12, Ithaca, New York.
- Henderson, R.W. and R. Powell. 2009. *Natural History of West Indian Amphibians and Reptiles*. University Press of Florida, Gainesville, Florida.
- Henderson, R.W. and R. Powell. 2018. *Amphibians and Reptiles of the St. Vincent and Grenada Banks, West Indies*. Edition Chimaira, Frankfurt am Main, Germany.
- Hodge, K.V.D., E.J. Censky, and R. Powell. 2003. *The Reptiles and Amphibians of Anguilla, British West Indies*. Anguilla National Trust, The Valley, Anguilla.
- Joglar, R.L. 2005. Anfibios, pp. 39–96. In: R.L. Joglar (ed.), *Biodiversidad de Puerto Rico. Vertebrados Terrestres y Ecosistemas*. Editorial Instituto de Cultura Puertorriqueña, Serie de Historia Natural, San Juan, Puerto Rico.
- Kolbe, J.J., P.L. Colbert, and B.E. Smith. 2008. Niche relationships and interspecific interactions in Antigua lizard communities. *Copeia* 2008: 261–272.
- Knapp, C.R. 2007. Lesser Antillean Iguana (*Iguana delicatissima*). *Iguana Specialist Group Newsletter* 10: 13–14.
- Knapp, C.R. and L. Price. 2008. *Eretmochelys imbricata* (Hawksbill Sea Turtle). Predation. *Herpetological Review* 39: 213–214.
- Lewis, A.R. 1986. Body size and growth in two populations of the Puerto Rican Ground Lizard (Teiidae). *Journal of Herpetology* 20: 190–195.
- Lewis, A.R. 1989. Diet selection and depression of prey abundance by an intensively foraging lizard. *Journal of Herpetology* 23: 164–170.
- Meier, A.J., R.E. Noble, and S.L. Rathbun. 1993. Population status and notes on the biology of the St. Croix Ground Lizard on Green Cay (St. Croix, U.S. Virgin Islands). *Caribbean Journal of Science* 29: 147–152.
- Meshaka, W.E., Jr. 1996. Diet and colonization of buildings by the Cuban Treefrog, *Osteopilus septentrionalis* (Anura: Hylidae). *Caribbean Journal of Science* 32: 59–63.
- McCoy, C.J. 1970. A systematic review of *Ameiva auberi* Cocteau (Reptilia, Teiidae) in Cuba and the Bahamas. II. The Bahamian subspecies. *Annals of the Carnegie Museum* 41: 118–151.
- Powell, R., R.W. Henderson, and J.S. Parmelee, Jr. 2005. *Reptiles and Amphibians of the Dutch Caribbean: Saba, St. Eustatius, and St. Maarten*. St. Eustatius National Parks Foundation, Gallows Bay, St. Eustatius, Netherlands Antilles.
- Powell, R., R.W. Henderson, and J.S. Parmelee, Jr. 2015. *Reptiles and Amphibians of the Dutch Caribbean: St. Eustatius, Saba, and St. Maarten*. 2nd ed., revised and expanded. Nature Guide Series No. 004. Dutch Caribbean Nature Alliance, Kralendijk, Bonaire.
- Ríos-López, N., R.L. Joglar, C.A. Rodríguez-Gómez, C.J. Díaz-Vázquez, and I. Rivera. 2015. Natural history notes of saurophagy: An update from the Puerto Rican vertebrate fauna. *Life: The Excitement of Biology* 3: 118–136.
- Rivero, J.A. 1998. *Los Anfibios y Reptiles de Puerto Rico, segunda edición revisada. The Amphibians and Reptiles of Puerto Rico, second edition revised*. University of Puerto Rico, San Juan.
- Rivero, J.A. and D. Seguí Crespo. 1992. *Anfibios y Reptiles en Nuestro Folklore*. Imprenta San Rafael, Quebradillas, Puerto Rico.
- Rodríguez Schettino, L. and V. Rivalta. 2007. Efectos probables del aumento del nivel del mar sobre la herpetofauna de la Reserva de la Biosfera Ciénaga de Zapata, Matanzas, Cuba. *Poeyana* 495: 8–13.
- Schell, P.T., J.S. Parmelee, Jr., and R. Powell. 1993. *Ameiva chrysolaeama*. *Catalogue of American Amphibians and Reptiles* 563: 1–6.
- Schmidt, K.P. 1920. Contribution to the herpetology of Porto Rico. *Annals of the New York Academy of Sciences* 28: 167–200.
- Schmidt, K.P. 1928. Amphibians and reptiles of Porto Rico, with a list of those reported from the Virgin Islands. *New York Academy of Sciences* 10(Part 1): 1–160.
- Schwartz A. 1970a. A systematic review of *Ameiva auberi* Cocteau (Reptilia, Teiidae) in Cuba and the Bahamas. I. The Cuban subspecies. *Annals of the Carnegie Museum* 41: 45–117.
- Schwartz A. 1970b. A systematic review of *Ameiva auberi* Cocteau (Reptilia, Teiidae) in Cuba and the Bahamas. III. Discussion. *Annals of the Carnegie Museum* 41: 152–168.
- Smith, B.E. and R.E. Baum. 2000. Surveys of the Lizards *Anolis wattsi* and *Ameiva griseboldi* on Antigua Offshore Islands I: Summer 1999. Antigua Racer Conservation Project No. 5, Pre-publication Draft Report. Black Hills State University, Spearfish, South Dakota.
- Sproston, A.L., R.E. Glor, L.M. Hartley, E.J. Censky, R. Powell, and J.S. Parmelee, Jr. 1999. Niche differences among three sympatric species of *Ameiva* (Reptilia: Teiidae) on Hispaniola. *Journal of Herpetology* 33: 131–136.
- Stewart, M.M. and L.L. Woolbright. 1996. Amphibians, pp. 237–320. In: D.P. Reagan and R.B. Waide (eds.), *The Food Web of a Tropical Rain Forest*. University of Chicago Press, Chicago, Illinois.
- Torres [López], J., Y.U. Alfonso, and O.J. Torres. 2014. A newly discovered population of the Cuban Ameiva, *Ameiva auberi* (Sauria: Teiidae), from Cayo Galindo in the Sabana Archipelago. *Reptiles & Amphibians* 21: 105–107.
- Uetz, P., P. Freed, and J. Hošek (eds.). 2018. The Reptile Database (<http://www.reptile-database.org>).