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Observations of Reptiles on Huevos Island, Trinidad, with Five Lizard Species Newly Recorded for the Island

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ABSTRACT

Observations of reptiles are reported for Huevos Island, Trinidad, with five new lizard records noted for the island. Interesting behaviour in the species *Cnemidophorus lemniscatus* and a fairly unique pattern of distribution in three congeners of *Gonatodes* raise interesting questions that may generate future scientific inquiry. Comments are made on the need for further research in the areas of biodiversity and biogeography in the region.

Key words: Bocas Islands, Huevos Island, *Gonatodes*, *Sphaerodactylus*, *Thecadactylus*, *Gymnophthalmus*, *Cnemidophorus*, *Iguana*, *Tropidurus*, *Mabuya*, *Eretmochelys*.

INTRODUCTION

Huevos is a tiny island of about 225 acres situated in the middle of the Bocas Islands between the Paria Peninsular of Venezuela and the Chaguaramas Peninsular of northwestern Trinidad. It is a very rugged island, rising to a height of just over 180 m. Steep cliffs line most of its coastline, with the most notable exception being a small sandy beach at Tortue Bay on the southern tip of the island. The island receives comparatively little rainfall. It is very dry and has a flora that forms a dry tropical deciduous forest that is typical of the Bocas Islands (Beard 1946).

The island is uninhabited and largely undeveloped, with only one building and a strong concrete jetty at Tortue Bay. Huevos is the least visited and the least studied of the Bocas Islands. Although a few herpetological observations for Huevos exist in the literature (Boos 1967, 1977, 1983-1984; Bacon 1973, 1981; Emsley 1977) recent new locality records for herpetofauna on other Bocas Islands (Lall and Hayes 1999; Charles 2007a) encouraged us to visit Huevos with the intention of conducting a brief but intense herpetological survey to update the species list for the island.

METHODS

The authors visited Huevos between 3 and 5 July, 2007. The beach at Tortue Bay, along with the building and the surrounding yard, as well as the scrub forest for about 300 m along a gully on the slope northwards of the beach served as our study area. Expansion to include a broader search area was limited by time and terrain.

We conducted visual searches for reptiles. We searched the outer walls and under-house area of the intact building as well as the shell of a nearby old wooden structure, now very dilapidated and vine-covered. We rummaged through piles of building debris, leaf litter and a pile of coconut husks in the area surrounding the house. The beach, the small and fairly

open shrubby transitional area between the beach and the forest, as well as the forested gully and slope were surveyed by examining the ground, the leaf litter and the low vegetation; the trunks and branches of the trees in the area were also checked for the presence of reptiles. We surveyed the forested area up the gully by rummaging through leaf litter, overturning fallen logs, bark and rocks; we also examined low vegetation and cervices in tree trunks and rocks. The areas around the house and the beach were searched during daylight and night time hours, while the forested area was searched only during daylight hours and no later than 1730 h. A total of 18 hours and 17 minutes of day time searching and 5 hours and 30 minutes of night time searching was conducted over the course of the three-day survey.

Reptiles were identified using Murphy (1997). Captured specimens were measured from snout to vent (SVL) and on tail (T), and were weighed. In the case of turtles, carapace length (CL) and the broadest carapace width (CW) were determined. Sex was determined when possible and some lizards were marked by non-lethal toe-tip clipping and released as part of a more long-term population study. A few lizards were retained to serve as voucher material. All handling methods used were in keeping with standard methods endorsed by the three major professional herpetological societies in the United States of America (A.S.I.H.-H.L.-S.S.A.R., 2004). Data regarding the microhabitat in which each animal was observed were recorded.

OBSERVATIONS

Order Squamata, Suborder Sauria (Lizards)

Family Gekkonidae

Gonatodes ceciliae Donoso-Barros. There is no prior report on the occurrence of this species on Huevos Island. The first individual observed was a male sighted

at 1232 h on 3 July by one of the authors (S.S.), 0.2 m up on the trunk of a tree on the forest-covered slope north of Tortue Bay. It appeared to have a solid red-brown coloured head. This individual was not caught. Subsequently on 3 and 4 July, a few males (including a sub-adult) were observed and caught in the area surrounding the first sighting. One male (retained as a voucher) did not have the solid red-brown coloured head; instead, on the red-brown background of its head there was a pattern of yellow variegation indistinctly outlined with black.

Gonatodes humeralis (Guichenot). This is the first record of this gecko for the island. An adult female was sighted by one of us (S.P.C.) on 3 July at 1600 h but eluded capture. It was on a vine, about 0.4 m off the ground, on the forested slope about 250 m up along the gully. A few individuals of both sexes were subsequently seen and/or caught in the same area on 3, 4 and 5 July. A voucher specimen of each sex was taken.

Gonatodes v. vittatus (Lichtenstein). Boos (1967) reported the presence of this gecko on Huevos. Several individuals of both sexes were observed each day of the survey during daylight hours in rubble, on the walls around the house, as well as on the lower reaches (less than 1.5 m up) of the trunks of trees growing on the slopes about 250 m up along the gully. A female specimen retained as a voucher had trombiculid mites (reddish-orange in colour) anterior to the cloaca.

Sphaerodactylus molei Boettger. No prior record of this species is known for Huevos. A gravid female was caught by one of us (S.P.C.) at 1143 h on 5 July. It was found in the house on the concrete floor of a toilet stall. The gecko was kept in cavity for several days and was later euthanized and prepared as a voucher specimen. During this time, it produced a single egg.

Thecadactylus rapicauda (Houttuyn). Surprisingly, this species was not previously recorded for Huevos. The first observation of this gecko was made (by S.S.) at 0840 h on 3 July, 2.3 m up on the concrete-paved inner wall of a toilet stall. It was caught, measured and released, but its sex was not noted. At least two other individuals were seen on the outer walls of the house between 1945 h and 2030 h on 4 July. The characteristic rattling chirp of some hidden individuals was heard between 0140 and 0200 h on 5 July at the house.

Family Gymnophthalmidae

Gymnophthalmus sp. Merrem. No prior record of this genus on Huevos was found in the literature. A juvenile specimen was found by one of us (S.P.C.) at 1130 h on 3 July in leaf litter in an open sunny area 8 m from the beach, close to the house. Two attempts to count the ventral scales between the pectoral and anal plates in order to assign it to one of two local congeners (Murphy 1997), resulted in a somewhat uncertain count of 22. Unfortunately, it was not

kept as a voucher. Based on this uncertain scale count, we provisionally assign it to the species *G. underwoodi* Grant. When additional material becomes available in the future it may then be possible to determine whether or not the Huevos population is more closely aligned to *G. speciosus* (Hallowell) found about 1 km away on the nearby island of Chacachacare as well as from southeastern Mexico to northern South America, or to *G. underwoodi* which has a distribution ranging from the Orinoco Basin to Trinidad and the Lesser Antilles.

Family Teiidae

Cnemidophorus lemniscatus (Linnaeus). Boos (1967, 1983-1984) commented on the presence of this teiid and speculated on its mode of colonization of Huevos. We observed scores of individuals in the fairly open shrubby area just above the beach and around the house, foraging in the leaf litter and basking in the bright sunny hours on 3 July. Courtship activity was observed at 0915 h on 3 July. A few individuals were also observed on the upper part of the beach. None was seen on the following days, which were at times overcast and with intermittent rain. We caught an adult male that had been basking in the sun near the house at 0930 h on 3 July. There were a few small ticks on its head. The animal was kept in captivity for three days before it was prepared as a voucher specimen. During this time, it defecated seeds which came from a small, ovoid, reddish-orange fruit (less than 1 cm long) that grew on a shrub about 3 m in height near the house. The captive *C. lemniscatus* consumed this fruit when placed together with it.

Family Iguanidae

Iguana iguana iguana (Linnaeus). This large lizard was recorded on Huevos by Boos (1967). No live specimens were observed during our survey, but we found a partial skeleton of a large lizard with a lower jaw lined with teeth characteristic of this species. It was found in the leaf litter near the house.

Tropidurus plica (Linnaeus). This mainly arboreal iguanid (*sensu lato*) was previously recorded on Huevos by Boos (1967). We observed at least two individuals on tree trunks on the forested slope some distance up the gully on 3 July.

Family Scincidae

Mabuya nigropunctata (Spix). (Miralles *et al.* 2005 have revised the *Mabuya* of Venezuela and concluded that in Trinidad, what was considered *M. bistrriata* (Spix) should now be termed *M. nigropunctata*). This is the only skink species known to occur locally; it was first recorded on Huevos by Boos (1967). We made two observations

of this species, one at 0938 h on 3 July and the other at 1106 h on 4 July. On both occasions it was seen foraging in leaf litter in the fairly open area above the beach, near the house.

Order Chelonia (Turtles)

Family Cheloniidae

Eretmochelys i. imbricata (Linnaeus). This species was previously reported on Huevos by Bacon (1973). At least three females were seen to come ashore between

2230 h on 4 July and 0125 h on 5 July and were observed searching for suitable nesting sites on the beach. One began to deposit eggs at 0035 h. The excavated hole in the sand was about 0.3 to 0.5 m deep and was located a few metres above the high water mark, in the middle of the beach under a machineel tree (*Hippomane mancinella*). The dimensions of the carapace of this female are given in Table 1. Oviposition of a few dozen eggs concluded at 0058 h, the nest was covered and the turtle returned to the sea at 0125 h on 5 July.

Table 1. Reptiles observed during study with abundance, specimen dimensions and habitat data.

Sauria (Lizards)

Genus	Species	Subspecies	Common Name	Sex/Age	Total No. of Sightings	Voucher Taken	SVL (mm)	T (mm)	mass (g)	Habitat of Observation
<i>Gonatodes</i>	<i>ceciliae</i> *		Variegated Gecko	M	4	Yes	48	62	2.6	Lower tree trunks on forested slope.
<i>Gonatodes</i>	<i>humeralis</i> *		Spot-nose Gecko	M	3	Yes	34	42	1.0	Lower tree trunks on forested slope.
				F	3	Yes	32	42	0.8	
<i>Gonatodes</i>	<i>vittatus</i>	<i>vittatus</i>	Streak Lizard	M	4	No				On walls and in rubble around house and on lower tree trunks on forested slope.
				F	12	Yes	35	43	1.2	
				Juvenile	1	No				
<i>Sphaerodactylus</i>	<i>molei</i> *		Mole's Gecko	F	1	Yes	26	25	0.5	Concrete floor of toilet stall at house.
<i>Thecadactylus</i>	<i>rapicauda</i> *		Woodslave	Adult	3	No	74	17	8.4	Walls around house.
<i>Gymnophthalmus</i>	<i>underwoodi</i> * #		Shiny Lizard	F*	1	No	24	39	0.3	Leaf litter in open sunny area near beach and house.
<i>Cnemidophorus</i>	<i>lemniscatus</i>		Foot-shaker Lizard	M	Uncounted	Yes	80	220	16	Leaf litter in open sunny area behind beach, upper beach and around house.
				F	Uncounted	No				
				Juvenile	Uncounted	No				
<i>Iguana</i>	<i>iguana</i> @	<i>iguana</i>	Green Iguana	Adult	1	Yes				Skeleton found in open shrubby area behind beach near house.
<i>Tropidurus</i>	<i>plica</i>		Spiny Tree Lizard	Adult	2	No				Tree trunks on forested slope.
<i>Mabuya</i>	<i>nigropunctata</i>		Bronze Skink	Adult	2	No				Leaf litter in fairly open shrubby area near house.

Chelonia (Turtles)

Genus	Species	Subspecies	Common Name	Sex/Age	Total No. of Sightings	Voucher Taken	CL (mm)	CW (mm)	Mass (g)	Habitat of Observation
<i>Eretmochelys</i>	<i>imbricata</i>	<i>imbricata</i>	Hawksbill Turtle	F	3	No	820	770	Not Rec'd	Sandy beach.

Key: * New record, # Tentative species assignment, @ Only skeletal material found

Table 2. Other reptiles previously recorded for Huevos but not observed during this study (from Boos, 1983-1984).**Sauria (Lizards)**

Genus	Species	Subspecies	Common Name
<i>Anolis</i>	<i>chrysolepsis</i>	<i>planiceps</i>	Jungle Anole
<i>Anolis</i>	<i>extremus</i>		Barbados Anole

Serpentes (Snakes)

Genus	Species	Subspecies	Common Name
<i>Atractus</i>	<i>trilineatus</i> ®		Three-lined Snake
<i>Leptodeira</i>	<i>annulata</i> ®	<i>ashmeadi</i>	False Mapepire
<i>Mastigodryas</i>	<i>boddaerti</i>	<i>boddaerti</i>	Machete Couesse
<i>Oxybelis</i>	<i>aeneus</i> ®		Horse Whip
<i>Sibon</i>	<i>nebulata</i> ®	<i>nebulata</i>	Fiddle String Mapepire
<i>Tantilla</i>	<i>melanocephala</i> ®	<i>melanocephala</i>	Blackhead Snake

Key: ® Regard record as suspect until recollected and recorded

DISCUSSION

Several interesting questions have been raised by this survey. The authors note that typically no more than two species of diurnal geckos of the genus *Gonatodes* co-occur in most of their range in northeastern South America. In cases of two congeners in sympatry, the usual combination is of a large species and a comparatively smaller one (Powell and Henderson 2005). Powell and Henderson (2005) note that the situation on Trinidad and the adjacent area of the Paria Peninsular in Venezuela is different in that three species (the large *G. ceciliae*, the medium sized *G. humeralis* and the small *G. vittatus*) exist in sympatry. On Huevos, this arrangement is taken to the extreme in that in our observation, all three congeners could be found in a very small area of less than 12 m² and, in some cases, on the same tree trunk. What allows these very closely related species to partition their shared habitat and limited resources while sustaining seemingly vibrant populations?

Interesting also is our observation of the consumption of plant matter by *Cnemidophorus lemniscatus* on Huevos. Most populations of *C. lemniscatus* feed almost exclusively on small arthropods (mainly on insects). However, it has been found that some insular forms supplement their diets by consuming fruits, leaves and flowers and, in some island races of the species including *C. l. arubensis* and *C. l.*

murinus, the diet is primarily vegetarian (Schall and Ressel 1991; Dearing and Schall 1992). It has been suggested that the herbivorous nature of these island forms is an adaptation that compensates for the impoverished assemblage of arthropods on small islands compared to mainland areas (Janzen 1973). To what extent then do *C. lemniscatus* on Huevos and by extension on nearby Chacachacare depend on plant matter for sustenance, and how do they compare in this regard to populations of the species on the southern and eastern coasts of Trinidad and on Tobago?

Lack of observation does not equate to absence but, on Huevos, this raises some important questions. Boos (1967) released six pairs of *Anolis extremus* (lizards native to Barbados) on Huevos to conduct an experiment in survival. Upon conducting a survey in 1976, the lizard was found to be present (Boos 1977). Our survey found no specimens of this introduced anole nor, for that matter, did we locate the cryptic native anole *Anolis chrysolepsis planiceps* which was noted by Boos (1967) to be present. Was *A. extremus* successful in establishing itself on Huevos and is it still extant? A particularly dry season prior to our survey in 2007 might explain the complete lack of snake sightings during our survey, but even Boos (1983-1984) cautioned readers with respect to the validity of Emsley's (1977) seemingly uncertain Huevos records of the following snake species:

Atractus trilineatus, *Leptodeira annulata ashmeadi*, *Oxybelis aeneus*, *Sibon nebulata nebulata* and *Tantilla melanocephala* (see Table 2). [Boos (1983-1984) suggested that his personal communication with Emsley of 1982 did nothing to clarify the records in question as Emsley had lost his notes and could not say where he might have deposited his specimens. Boos (1983-1984) also noted that the island's long standing status as privately leased land rendered access for exploration somewhat limited and implies some level of uncertainty regarding the circumstances of Emsley's visit to collect specimens there. As such, he suggested that the previously mentioned list of snakes recorded for Huevos be regarded as 'suspect' until recollected and recorded. There have been no records of any of the 'suspect' species since then to lend credence to Emsley's claims]. Also of interest is the complete absence of reports in the literature of the teiid *Ameiva ameiva* (Zandolie or Ground Lizard) on Huevos. This large ground-dwelling lizard is common on all the other Bocas Islands (Boos 1983-1984; Charles 2007b) and is not, under normal circumstances, difficult to locate in areas where they are present.

The biodiversity of Huevos Island and, by extension, that of the Bocas Islands is quite interesting. As Trinidad and Tobago hasten down a path of economic development, will our government and our society at large recognize that there is no sustainable economic development without a consideration of the ecology? The present lessees of the island of Huevos continue to promote conservation by their commitment to restrict development on the island. In three days, our two-person study added five reptilian species [all listed as probable inhabitants by Boos (1983-1984)]. This study has raised a number of academically interesting questions and, hopefully, will serve to generate further interest in scientific investigation into the biodiversity and biogeography of the Bocas Islands. Hopefully also, it may influence government policy and national sentiment towards conservation of biodiversity.

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