

REPTILIA: SQUAMATA: IGUANIDAE

CYCLURA CORNUTA

Catalogue of American Amphibians and Reptiles.

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***Cyclura cornuta* (Bonnaterre)**
Hispaniolan Rhinoceros Iguana

Lacerta Cornuta Bonnaterre 1789:40. Type locality, "Sainte-Domingue ... dans les mornes de l'hôpital, entre l'Artibonite et les Gonaïves." Holotype, not located.

Lacerta cornuta: Bechstein 1800:499.

Iguana cornuta: Latreille 1801:267.

Metopoceros cornutus: Wagler 1830:147.

Metopoceros cornutus: Gray 1845:188. Incorrect subsequent spelling.

Hypsilophus (Metopoceros) cornutus: Fitzinger 1843:54.

Metopoceros cornutus: Cope 1866:124. Incorrect subsequent spelling.

Cyclura cornuta: Cope 1885 (1886):263. First use of present combination.

Aloponotus cornutus: Perrier 1928:3095.

Cyclura cornuta cornuta: Barbour 1937:132. See Remarks.

Cyclura cyclura cornuta: Warner 1997:59. *Lapsus*.

• **CONTENT.** No subspecies are recognized, but see Remarks.

• **DEFINITION.** *Cyclura cornuta* is a large iguana (maximum SVL of females to 510 mm, of males to 463 mm) (Schwartz and Henderson 1991, who also provided the following scale counts). The frontal and one or two pairs of prefrontals are enlarged. The frontal is separated from the interparietal by 11–13 (mode 10) scale rows and bordered by 13–29 (mode 18) scales. The precanthal is never in contact with the first prefrontal. No azygous scales are present between prefrontals, but scale rows between prefrontals number 3–7 (mode 4). Anterior canthals are separated by 8–17 (mode 13) scales. Scale rows between infralabials and sublabials number 3–6 (mode 4), sublabials to center of eye 6–18 (mode 12), suboculars to anterior border of tympanum 10–16 (mode 12), and postmentals 1–4 (mode 3). Loreals are not present in obvious rows. The rostral and nasals are separated by 0–2 scale rows. Naris to eye distance is equal to 13–44 dorsolateral body scales. Dorsal crest scales between



FIGURE 1. An adult male *Cyclura cornuta* from Isla Cabritos, Lago Enriquillo, Hispaniola.



FIGURE 2. Adult male *Cyclura cornuta* from Parque Nacional Jaragua, República Dominicana, at ZOODOM (Parque Zoológico Nacional).

occiput and first caudal vertical number 66–104; dorsal crest scales between occiput and shoulder 14–25, between shoulder and sacrum 40–56, and between sacrum and first caudal vertical 12–23. Scales around fifth caudal vertical number 33–51. Dorsal crest scales on the body are always higher than crest scales on



MAP. Distribution of *Cyclura cornuta*. The circle represents the type locality, other localities are marked with dots (modified from Schwartz and Henderson 1991 and Ottenwalder 1999 [2000]).

the neck, and postsacral crest scales are almost always higher than body crest scales. A total of 32–80 femoral pores are in 1–3 (mode 2) rows.

Adult ground color varies from gray to grayish brown or black; the rump and tail are sometimes lighter (Mertens 1938). Adults generally lack any discernible pattern, but juveniles often have about nine vaguely outlined pale lateral crossbars on a very dark gray or black ground color.

Mertens (1939b) noted that females tend to have less prominent “horns” and middorsal crest scales.

• **DIAGNOSIS.** *Cyclura cornuta* may be distinguished from all congeners except *C. onchiopsis* and *C. stejnegeri* by the presence of 1–2 pairs of enlarged prefrontals and an enlarged frontal. *Cyclura cornuta* is distinguished from *C. onchiopsis* by 13–26 dorsolateral scales in a distance equal to that between the naris and the eye versus 30–44 in *C. onchiopsis*, and from *C. stejnegeri* by a mode of 12 sublabial scales ($N = 58$) to the center of the eye versus 8 ($N = 18$) in *C. stejnegeri*; a number of additional modal differences, many with non-overlapping ranges, also distinguish these closely related taxa (Schwartz and Carey 1977).

• **DESCRIPTIONS.** Descriptions, some very brief, are in Barbour and Noble (1916), Bechstein (1800), Boulenger (1885), Capula (1989), Cochran (1924, 1928, 1941), Cope (1885, 1885 [1886]), Daudin (1802), Duméril and Bibron (1837), Garman (1887 [1888]), Günther (1882), Lacepède (1789), Schwartz and Carey (1977), Schwartz and Henderson (1991), and Wagler (1830). Günther (1882) presented a table comparing morphological measurements of *Cyclura* (including this species) and *Iguana*. Barbour (1919) compared the skeleton to *C. portoricensis* (= *C. pinguis*) from Puerto Rico. Cochran (1941) compared *C. cornuta* with *C. stejnegeri* and *C. onchiopsis*. Iverson (1980, 1982) described the morphology of the gastrointestinal tract. Gorman et al. (1967) described the karyotype consisting of 12 metacentric macrochromosomes and 24 microchromosomes.

• **ILLUSTRATIONS.** Photographs of live *Cyclura cornuta* are in Alberts (1999 [2000]), Anon. (1978, 1996), Aresté (1998), Banbury et al. (2000, including the cover), Bartlett and Bartlett (1995), Blair (1992, 1994), Bosch and Werning (1991), Boylan (1984), Brice (1995), Burchfield (1973, 1977), Capula (1989), Duval (1976), Friedrich (1979), Grzimek (1971), Hairston (1990), Hamilton (1995), Hoppe (1989), Klingel (1929), Malfatti (1996), McKeown (2000), Mertens (1940), Noble (1923), Ottenwalder (1978a, 1979a), Peters (1982a, b), Powell (1999a, 2000), Reece et al. (1986), Roberts and Roberts (1996), Sanlley Castro and Duval (1979), Schmidt and Inger (1957), Shipley (1993), Sprackland (1992), Staten (1997), Strassen (1913), Tonge and Bloxam (1984), Trias et al. (1997), Uchiyama (1997), Underwood (1953), Valdez Sierra and Mateo Félix (1992), and Warner (1997). Additional photos, independent of articles, appeared in issues of the Iguana Times (Journal of the International Iguana Society): Vol. 1(6) (including the cover) and Vol. 7(2):39. Noble (1923) included photographs of nest sites and burrows, Tonge and Bloxam (1984) provided a photograph of a burrow in an indoor enclosure, and Aresté (1998) illustrated habitat on Isla Cabritos. Two photographs of dorsal and lateral views of a museum specimen are in Barbour and Noble (1916). Mertens (1939b) included photographs of ventral views of the feet from two specimens. Tonge and Bloxam (1984) provided a photograph of a dead embryo in an egg. A photograph of the proximate colon is in Iverson (1980, 1982), a longitudinal section of a radius in Reece et al. (1986), and a left humerus in Miller (1919).

Radiographs of a broken and a set limb are in Hamilton (1995). Jacobson et al. (1980) included **micrographs** of microorganisms in a liver sinusoid and a blood smear from a diseased

specimen. Simpson et al. (1981) provided electron micrographs of bacteria in blood and marrow. Simpson et al. (1982) included light and electron micrographs of sickled blood cells. Micrographs of a cross-section through a diseased femur and of osteoblast-like cells in abnormal bone are in Reece et al. (1986).

Drawings are in Bonnatere (1789), Günther (1882), Strassen (1913), and Woods et al. (1992); Günther (1882) also included drawings of the skull. Böker (1939) provided drawings of a hindfoot and digestive organs. A drawing of the head is in Warner (1997, as *Cyclura cyclura cornuta*), and drawings of head scalation are in Cochran (1941) and Schwartz and Carey (1977). de Queiroz (1987) illustrated the skull, premaxilla, posterolateral corner of the skull, and the middle part of the right mandible.

• **DISTRIBUTION.** *Cyclura cornuta* is widely distributed in xeric areas on Hispaniola, including Isla Beata, Île de la Gonâve, Île de la Petite Gonâve, Île Grande Cayemite, and Île de la Tortue. Schwartz and Henderson (1991) questioned reports of specimens from Île de la Petite Cayemite and Isla Saona (although these are indicated on the map). Many local populations have been extirpated and numbers in many others have declined. However, populations in protected areas near Lago Enriquillo and in Isla Cabritos and Jaragua national parks appear to be thriving.

Schwartz (1980) and Powell et al. (1999) considered *Cyclura cornuta* to be an “islandwide” species (i.e., not endemic to either the North or South paleoislands).

King and Krakauer (1966) reported an introduction to several “islands” at the Miami Seaquarium, Virginia Key, Dade County. Although several animals escaped from the exhibits, they did not appear to be breeding and the only subsequent report on Florida exotics to mention this species was Smith and Kohler (1977 [1978]). Banks et al. (1987) listed “*Cyclura cornuta* (Bonnatere, 1789),” but whether this was in reference to escapees in Florida or to *C. onchiopsis* of Navassa Island or *C. stejnegeri* from Isla Mona (both were considered subspecies of *C. cornuta* by most authorities at that time) is uncertain. Escaped animals failed to become established in Surinam (Hoogmoed 1981).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** The following survey of the literature is presented by topic: **abdominal skeleton** (Etheridge 1965), **action of adenosine deaminase** (Ma and Fisher 1971), **commercial trade** (Honegger 1974, Anon. 1996), **comparisons with other iguanids** (Hollingsworth 1998), **conservation status** (Westermann 1953, Ottenwalder 1999 [2000], Powell et al. 2000), **genome** (Olmo 1986), **herbivory** (Knapp 1998), **husbandry, management, and release programs** (Amphibian Special Interest Group et al. 1990; Anon. 1978, 1980, 1991, 1999; Blair 1992, 1993, 1994; Bosch and Werning 1991; Bowler 1996; Boylan 1984, 1985; Brice 1995; Burchfield 1973, 1977; Carey 1973; Christie 1996; Coborn 1975; Crutchfield 1985; Duval 1976, 1982 [1983]; Friedrich 1979; Frye and Townsend 1993; Haast 1969; Hairston 1990; Hamilton 1995; Honegger 1975; Malfatti 1996; Murphy 1969; Noegel 1989; Ottenwalder 1978a, b, 1979a, b, c, 1980, 1994a, b; Peters 1982a, b; Powell 2000; Roberts and Roberts 1996; Sanlley Castro and Duval 1979; Shaw 1969; Shipley 1993; Snider and Bowler 1992; Sprackland 1992; Staten 1997; Tonge and Bloxam 1984; Wilke 1981), **interactions with nonsympatric lizards** (Hunsaker and Burrage 1969), **natural history and behavior** (Carey 1975; Ehrig 1996, 2000; Martins and Lamont 1998; Noble 1923; Wiewandt 1982), **parasites and treatment** (including bacteria) (Barrett et al. 1994; Holt and Lawrence 1982; Jacobson et al. 1980; Plowman et al. 1987; Simpson et al. 1981, 1982; Singh et al. 1996; Teow et al. 1992; Walton 1942), **phylogeny** (Avery and Tanner 1971, Crother 1999, de Queiroz 1987, Martins and Lamont 1998, Oldham

and Smith 1983, Schwartz and Carey 1977), **physiology** (Laing and Fraser 1999), **presence in protected areas** (Abreu and Guerrero 1997, Banbury et al. 2000, Hoppe 1989, Schubert and Santana 1996, Valdez Sierra and Mateo Félix 1992, Vifias Roman 1979, WIISG 1999), **pseudotumors** (Elkan and Cooper 1976), **relationship with *I. iguana*** (Hedges 1996), **response to *Alsophis*** (Carey 1966), and **role in seed germination** (Hartley et al. 2000).

The species is included in **notes, lists, and keys** (some with descriptions or notes on relationships or natural history) by Barbour (1914, 1930, 1935, 1937, 1945), Bartlett and Bartlett (1995), Boettger (1893), Böker (1939), Boulenger (1885), Capula (1989), Carey (1975), Cochran (1928), Cope (1866, 1868, 1885, 1885 [1886]), Cuvier (1817), Etheridge (1982), Eyerdam (1954), Fischer (1888), Frank and Ramus (1995), Garman (1887 [1888]), Gray (1845), Henderson and Schwartz (1984), Henderson et al. (1984), MacLean et al. (1977), Meerwarth (1901), Mertens (1938, 1839a,b), Müller (1892), Powell et al. (1996, 1999), Rosenthal (1996), Schmidt (1920, 1926), Schwartz and Carey (1977), Schwartz and Henderson (1985, 1988), Schwartz and Thomas (1975), SEA/DVS (1990a,b), Shaw (1802), Strassen (1913), Wagler (1830), Wiegmann (1834).

• **REMARKS.** Fitzinger (1843) correctly attributed the genus *Metopoceros* to Wagler (1830), but incorrectly attributed the species *cornutus* to him as well.

Considerable confusion exists in the literature regarding the relationships of *Cyclura* from Hispaniola, Navassa Island, and Isla Mona. Cope (1885) placed Hispaniolan *cornuta* in the monotypic genus *Metopoceros*, but placed Navassan *onchiopsis* and *nigerrima* in *Cyclura* (the latter are now recognized as a single taxon, now extinct; Thomas 1966, Schwartz and Carey 1977, Powell 1999b). However, Cope (1885 [1886]) referred "both" Navassan species to *C. cornuta*. Stejneger (1904) felt that specimens from Mona Island were unique, but he did not elevate them to species because of a captive Mona-like individual supposedly from Hispaniola (Günther 1882). However, Barbour and Noble (1916), in their description of *C. stejnegeri* as a distinct species, suggested that Günther's specimen was actually from Mona. Barbour and Noble (1916) also reestablished the Navassan form as distinct from *C. cornuta*, but Barbour (1937), without comment, listed the Navassan and Mona Island forms as subspecies of *C. cornuta*. Although Carey (1975) recognized the specific status of all three forms, most recent authors (e.g., Schwartz and Carey 1977, Schwartz and Henderson 1991, Powell et al. 1999, Thomas 1999) have considered *C. onchiopsis* and *C. stejnegeri* subspecifically related to *C. cornuta*. However, Powell (1993) listed *C. cornuta* among Hispaniolan taxa currently recognized as subspecies that might warrant full species status. Powell (1999b), based on a re-evaluation of data published in Schwartz and Carey (1977), re-elevated *C. onchiopsis* and strongly encouraged recognition of *C. stejnegeri* as a full species (see also Wiewandt 1977). Powell and Henderson (1999) followed those recommendations.

Dunn (1934) noted "... a fair number of records of [*Iguana*] *i. rhinolopha* in the literature from Hispaniola. These are all old records and may fairly be said to indicate *Cyclura cornuta*."

Lazell (1989), arguing that the genus *Cyclura* be relegated to the synonymy of *Iguana*, suggested that "the Mona Island form *stejnegeri* is in some respects intermediate between *pinguis* and Hispaniolan nominate *cornuta*..."

Because *Cyclura cornuta*, like all of its congeners, is extremely vulnerable to human exploitation, habitat alteration, and introduced predators (Burghardt and Rand 1982, Gabris 1994, Schubert 1993), it is listed under CITES, Appendix I.

Woods et al. (1992) proposed that *Cyclura cornuta* be designated the "national lizard" of Haiti.

• **ETYMOLOGY.** The specific name, *cornuta*, is from the Latin, meaning "horned."

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