Black Iguanas (*Ctenosaura similis*), such as this subadult, are exceedingly arboreal in the Guanacaste region of northwestern Costa Rica. This may be attributable to the relative scarcity of Green Iguanas (*Iguana iguana*) in the area.

Black Iguanas (*Ctenosaura similis*) are much less arboreal throughout most of their range in Costa Rica, where they coexist with Green Iguanas (*Iguana iguana*). This adult female is basking on a fallen log at Parque Nacional Manuel Antonio.

Distribution of iguanas in Costa Rica: *Iguana iguana* (gray circles), *Ctenosaura similis* (white circles), and *C. quinquecarinata* (squares). The latter is restricted to the northern part of Guanacaste Province in extreme northwestern Costa Rica. This map was adapted by John Binns from distribution maps provided in Savage (2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna Between Two Continents, Between Two Seas.* University of Chicago Press, Chicago, Illinois).

Black Iguanas (*Ctenosaura similis*) in Guanacaste, Costa Rica

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Photographs by the author except as indicated.

Three species of iguanas are native to Costa Rica: the Common or Green Iguana (*Iguana iguana*), the Black Iguana (*Ctenosaura similis*), and the Five-keeled Black Iguana (*Ctenosaura quinquecarinata*). Green Iguanas may exceed 2 m in total length, and larger adults in particular are almost exclusively arboreal. These lizards occupy Neotropical lowlands from Sinaloa and Veracruz, México through Central America to Ecuador on the Pacific versant and to Bolivia, Paraguay, and south-central Brasil on the Atlantic slopes. Other populations occur on some Lesser Antillean islands (see IGUANA 10(3), p. 71). The species also has become established in areas as geographically diverse as Puerto Rico, Florida, and Hawaii, primarily as a consequence of human agency (see IGUANA 10(4), p. 111). In Costa Rica, the species remains relatively common to elevations up to 500 m in lowland rainforests and gallery forests of both the Caribbean and Pacific versants. In drier areas, such as much of the Guanacaste region, however, this species is largely restricted to riparian situations.

Black Iguanas reach total lengths of about 1.3 m. These lizards are found in lowlands and lower premontane areas from the Isthmus of Tehuantepec eastward and southward on the Pacific versant to central Panamá and on the Atlantic versant to eastern Honduras, with scattered records in Costa Rica and central Panamá. *Ctenosaura similis* also has become firmly established in southern Florida (see IGUANA 10(4), p. 111). In Costa Rica, the species is locally abundant at elevations to 765 m in the Pacific lowlands. A single record in the Atlantic lowlands suggests that the species occurs there or may have formerly ranged up the valley of the Río Grande de Tárcoles. Ctenosaurs often adapt well to habitats altered, sometimes substantially, by humans. They occur in vacant city lots, gardens, cemeteries, junk piles, and rock walls or fence rows along cultivated fields. In more natural settings, they generally seem to prefer relatively open locations with rocky outcrops, fallen logs, or standing hollow snags. Black Iguanas are the most commonly observed iguanas in Costa Rica.

Three species of iguanas occur in Costa Rica: *Iguana iguana* (left), *Ctenosaura similis* (center), and *C. quiquecarinata* (right). *Photographs by R. Wayne Van Devender.*

Juveniles of the three species of iguanas that occur in Costa Rica: *Iguana iguana* (left), *Ctenosaura similis* (center), and *C. quiquecarinata* (right). *Photographs by R. Wayne Van Devender.*

Black Iguanas throughout most of the Costa Rican lowlands tend to perch low to the ground. For example, this female *Ctenosaura similis* at Parque Nacional Manuel Antonio is basking less than one meter above the ground.

One of the very few *Ctenosaura similis* observed on or near the ground in Guanacaste was this juvenile at Parque Nacional Santa Rosa. When disturbed, it hid in low vegetation instead of climbing a nearby tree. *Photograph by Michael Powell.*

Five-keeled Black Iguanas are relatively small, reaching a maximum total length of less than 500 mm. The species has a disjunct distribution in semiarid and subhumid areas in lowland forests of Pacific slopes. Populations are known from southern Oaxaca, México, west-central Nicaragua, and northwestern Costa Rica. Although Nicaraguan animals reach elevations of 600 m, no Costa Rican population is known to occur above 145 m. In Costa Rica, this species is restricted to lowland dry forests in the extreme northwestern corner of the country.

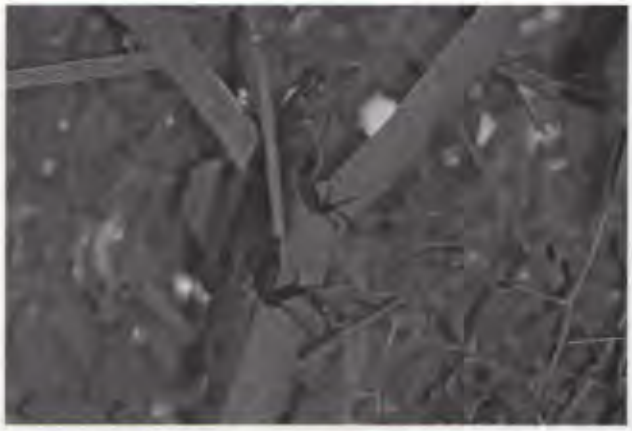
The Guanacaste region is situated in northwestern Costa Rica. Most of the area consists of a relatively dry, undulating plain. Because of prolonged dry periods, rivers exhibit marked seasonal differences in volume and silt load. The dry forests tolerate five or six months with less than 100 mm of precipitation. Mean monthly temperature highs are over 30°C throughout the year and approach 35°C during the height of the dry season. Mean monthly temperature minima only rarely drop below 20°C. Although severely impacted by human activities, the remaining dry tropical forests have only two strata, with the higher canopy trees reaching 20–30 m. These tend to have short, stout trunks and large, spreading crowns, which often fail to contact each other. Understory trees are 10–20 m tall and have slender, crooked trunks and open crowns. Canopy trees are deciduous, whereas some understory species are evergreen. Shrubs are stunted and most species are notable for their thorns or spines. Woody, but not herbaceous, vines are common. Epiphytes are occasional, with bromeliads most abundant.

At least some of the Guanacaste populations of *C. similis*, particularly in non-riparian situations, utilize habitat resources in strikingly different ways than conspecifics elsewhere in Costa Rica. Presumably because of the prevailing dry conditions, Green Iguanas are largely restricted to areas along streams and are rare or entirely absent from much of the region. Consequently, the arboreal niche utilized by that species in other parts of the country is available — and it is extensively and effectively exploited by *C. similis*.

During a recent visit to the Guanacaste region (November–December 2003), I saw only one juvenile on a pile of logs and one adult female foraging on the ground for fallen yellow blossoms. In contrast, literally dozens of lizards of all age

Individuals like this very dark *Ctenosaura similis* from near Playa Hermosa, Guanacaste Province, provide meaning for the common name, Black Iguana.

I observed this very large male *Ctenosaura similis* from near Playa Hermosa defend his territory against another male and court a female while never descending to within 15 m of the ground.



Opportunities for thermoregulation abound in arboreal habitats; this adult female *Ctenosaura similis* from near Playa Hermosa sought deep shade during the heat of the day.

This subadult *Ctenosaura similis* from near Playa Hermosa was on the ground feeding on fallen flowers, but immediately sought shelter in a nearby tree when disturbed.

Ctenosaurs basking high in trees were a common sight. In the course of the day, individuals would adjust their positions to exploit patches of sun penetrating through the upper canopy.

At least some individuals adapt readily to habitats provided by humans; however, I saw no iguanas on roofs or other man-made structures that were not accessible from adjacent trees.

classes were high in trees, where they were quite effectively mimicking behaviors I normally associate with Green Iguanas. I observed territorial defense, courtship, mating behavior, and competition for prime basking sites. Also, the locals with whom I spoke about iguanas indicated that "iguanas negras" were found in trees. My contention that the populations of *C. similis* in this area are much more arboreally inclined than others I have encountered was reinforced when the female that had been foraging on the ground was disturbed and immediately ran to and climbed the nearest tree. This stands in stark contrast to escape behavior I have observed in populations of *C. similis* elsewhere in Costa Rica or in other parts of the species' range, where individuals almost invariably seek shelter in excavated burrows or in hollow logs and snags.

The concept of "ecological release" is used to describe situations in which a population of plants or animals becomes capable of exploiting a resource not usually available due to competition, often with closely related and ecologically similar forms. However, ecological release does not typically entail an almost complete shift from one resource to another, such as that which I observed in *C. similis* in at least some parts of the Guanacaste region. Because I was unable to assess habitat associations throughout the year or even in weather other than the unusually cool, damp conditions I encountered at the very end of the rainy season of 2003, I am unable to state with any authority whether ecological release is evident or some other, possibly transitional factors were operative. Nevertheless, my observations suggest that interactions between *C. similis* and *I. iguana* might be far more complex than has generally been assumed, and that the habitat partitioning that is usually evident may reflect an effort to avoid competition as much as any preferences on the parts of the species involved.

References

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