

# GREEN IGUANAS: EMERALD GEMS OF THE JUNGLE

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The green or common iguana, *Iguana iguana*, has always been one of the most popular captive lizards, but in recent years its popularity has grown exponentially. This is certainly due to several factors: their spectacular appearance and impressive size, the docility of many individuals, and most recently their relatively low cost (due primarily to the large numbers of farm-raised animals now being imported into the U.S. from Central and South America). Add to all these attributes the fact that iguanas are generally very hardy in captivity and can be quite long-lived (15 to 18-year-old individuals are not unheard of), and it is easy to understand their appeal.

## Distribution

Green iguanas have a very wide geographic distribution and are found from northern Mexico (the town of Costa Rica, Sinaloa, on the West Coast and Laguan de Tamiahua, Vera Cruz, on the East Coast) to at least the Tropic of Capricorn in southeastern Brazil and Paraguay. There are also populations on many West Indian islands including Cozumel, the U.S. and British Virgin Islands, Aruba, Bonaire, Curacao, Guadalupe, St. Vincent, Grenada, Trinidad, Tobago, and numerous others.

Recently introduced animals have also established populations in areas well outside their natural range. Wild iguanas have been recorded from several valleys on Oahu, Hawaiian Islands, since the 1950's, and they also appear to be well established in the Miami area southward into the Florida Keys. They are most at home in tropical coastal lowlands under 500 meters elevation, but have been found up to 1,000 meters in some parts of Columbia.

## Size

Green iguanas are among the largest lizards in the Western Hemisphere. Some males may

exceed six feet in length and weigh over 15 pounds. Females are generally much smaller, and a four foot, seven or eight-pounder, would be considered large. Compared to iguanas of similar adult size (such as rock iguanas, genus *Cyclura*), the babies are born quite small, with snout-vent lengths of about 2.5 inches.

## Two Species

Currently, there are just two species recognized within the genus *Iguana*: the common or green iguana, *I. iguana*, and the Lesser Antillian iguana, *I. delicatissima*, found only on a very few islands in the Lesser Antilles. The main external difference between the two species is that *I. delicatissima* lacks the enlarged subtympenic scale so prominent on *I. iguana*.

Unfortunately, recent studies indicate that *I. delicatissima* is faring very poorly throughout most of its limited range. The pressures of habitat loss, hunting, and introduced exotic animals on delicate island ecosystems has caused the rapid depletion of this unique iguana. It is currently represented in U.S. collections by only a handful of individuals.

The green iguana, although not faring much better in many localities, is found over such a large area—millions of square miles, in fact—that it is not considered to be in any immediate danger of extinction and is listed as a C.I.T.E.S. appendix II animal.

## Color Variation

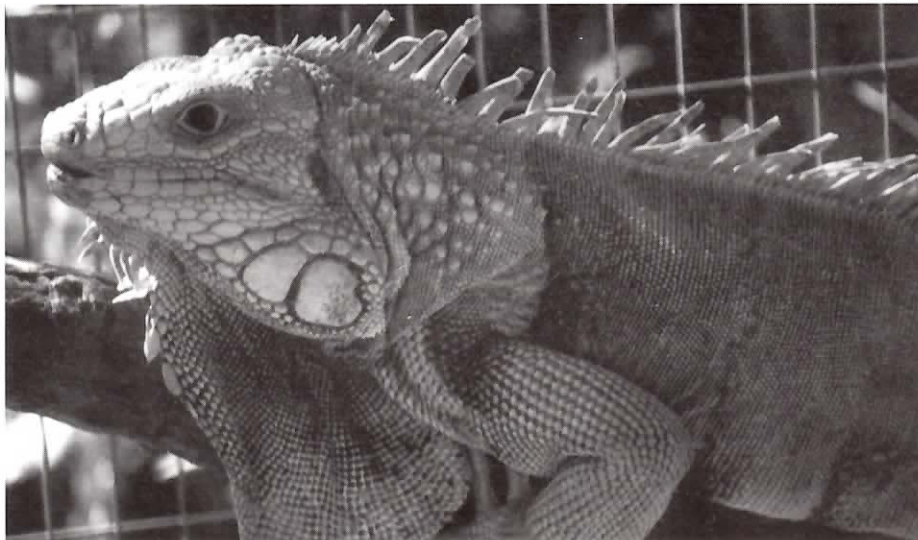
Because of their wide geographic distribution, green iguanas can vary considerably in color, size, and even physical characteristics. At one time, a subspecies, *I. i. rhinolopha*, was recognized based on the enlarged, hornlike scales which are present on the snout of some Mexican and Central American iguanas. This designation was dropped, how-

ever, when it proved to be inconsistent within populations in a given geographic area. North American green iguanas tend to have longer, more pointed heads and generally taller dorsal crest scales than some South American forms. These more northern iguanas may also exhibit more orange coloration, especially in adult males. In fact, there are some populations such as the ones near Playa Manuel Antonio, Costa Rica, where the iguanas have striking red heads!

In contrast, some South American varieties such as those from Surinam and Peru appear to have on average shorter, blunter heads, a stockier build, and rarely exhibit much orange coloration. Instead, many show very attractive shades of blue or turquoise, especially on the head and anterior portions of the body.

Some of the most unusual colors and patterns are seen on the various islands of the West Indies. Colors used to describe some of these animals may include: pink, lavender, gold, yellow, white, and in at least a few specimens, almost solid black. There have even been two or three albinos hatched out on iguana ranches in El Salvador during the last few years.

Nevertheless, the typical iguana is, as might well be expected, some shade of green, often with a darker vertical banding pattern, particularly on the flanks and with wide distinct black bands on the tail.



The green iguana, *Iguana iguana*, has rapidly become one of the most desired pets. However, its specialized requirements are so crucial to its well-being that owners must become well-informed about providing proper care. Photograph: Mark Dubin

## Food Value

One of the major reasons that green iguanas have decreased in numbers in the wild, especially near human populations, is that their flesh is highly prized as a food item by many native peoples. In addition, iguana eggs are consumed in large numbers, not just for their food value, but because many consider them an aphrodisiac. This led to thousands of both green and spiny-tailed (genus *Ctenosaura*) iguanas being offered for sale in markets throughout Latin America. These animals were often trussed up, sometimes with their own tendons, and mouths sewn shut with twine. When gravid females were captured, the eggs were often cut out and the adult animal crudely sutured together and then released in the mistaken belief that they would survive and produce more eggs which the iguana hunter could harvest at some future time.

## Farming Practices

Recognizing the economic importance of green iguanas to the native people and aware of the rapid decline in numbers of iguanas in some areas, several groups, including the Smithsonian Institution and San Diego Zoo's Center for Reproduction of Endangered Species, began captive breeding programs in Central America more than 10 years ago. Initially, some of these early iguana "farms" did little more than capture gravid

females from the wild and house them until they laid their eggs. The eggs were then incubated in semi-natural conditions until hatching. Once out of the eggs, hatchlings are raised on a homogenous diet to either a size suitable for harvesting for their meat or to where they are large enough to be released into the wild and avoid most of those predators that prey upon young vul-

nerable hatchlings and juveniles.

Since those early days, dozens of iguana farms have sprung up in Central and South America. Although difficult to verify, many of these farms now claim to be self sufficient—that they are raising their own hatchlings to breeding size and no longer take adult iguanas from the wild. These farms have recently realized the huge potential market for these field-raised baby iguanas in the U.S. pet industry and are currently exporting them by the thousands.

Because of political pressures from conservation organizations and in an effort to conserve their own natural resources, many countries such as Mexico, Honduras, and Guyana are currently closed to the export of green iguanas. These closures may change at any time, particularly when new governments come to power. Most of the iguanas now being sold in U.S. pet stores are from Colombia, El Salvador, and Guatemala. Young iguanas from any of these three countries generally arrive in good condition, although importers report “good” and “bad” shipments depending, apparently, upon conditions en route. Domestic U.S. bred iguanas are perhaps the most highly prized of all and generally demand the highest prices. Unfortunately, green iguanas only breed sporadically in captivity and are seldom offered for sale.

### **Housing for Captives**

Large, tame, long-term captive iguanas are the first choice of many people wanting to acquire a new animal. This is often impractical because of the very large enclosures required for these specimens and the fact that they may sell for hundreds of dollars. I have even seen a few very large spectacular individuals command as much as \$1,000 each!

The great majority of iguana owners begin with juvenile animals purchased from local pet stores. It is always recommended that you have a proper cage setup ready before bringing any animal home. Glass terrariums with screen tops are readily available, economically priced, and are produced in a variety of sizes and shapes. You may start a small iguana in a model 20 high terrarium (24" x 12" x 17"), but keep in mind that green iguanas grow rapidly and may eventually

reach four to six feet in overall length. For this reason, the initial purchase of a model 40 (36" x 15" x 17") or larger terrarium may prove more practical and less expensive in the long run.

There are a variety of substrate materials available for use on the cage bottom. The best of these are ones that can be easily discarded when soiled such as butcher paper, unprinted newspaper or industrial paper towels. In areas such as living rooms or offices where a nicer looking material is desired, indoor-outdoor carpet works well. It is often available in a variety of colors including green, blue and brown. Always have two pieces of carpet cut for each enclosure so you will have a clean one to put into the cage while the other is being washed and dried.

A mild disinfectant such as diluted Novasan or one cup of bleach in a gallon of water may be used to sterilize the inside of these glass enclosures during cleaning. Be sure to rinse them out again thoroughly with fresh water after disinfecting.

### **Heating and Lighting**

There are many products available to heat enclosures of this type. For smaller cages, one of the best methods is to use two 25-watt red incandescent light bulbs in a standard aquarium fixture and hood. For larger enclosures, you may use a 60 to 150-watt red bulb or floodlight in a round reflective shop light or clip-on type fixture and hood. Lights should always be outside of the cage so that the animal may not come in contact with the hot surface of the bulb which can cause severe thermal burns. Basking branches large enough to comfortably support the iguana's body can be set up under the light so that a hot basking spot reaching about 100 °F is available. Air temperature within the cage should provide a gradient from about 85 °F on the cooler side of the enclosure to about 95 °F at the warmer end during the daytime. It is important that iguanas reach these higher temperatures for they are hindgut fermenters and cannot properly digest their food at lower temperatures. At night, the ambient cage temperature can be lowered to 75 °F.

Never “guess” at the proper heat in a cage; use at least two wide range thermometers, one at each temperature extreme within the cage to

ensure acceptable heat levels. The wattage, number of bulbs, or distance of light from the terrarium can be varied to adjust for different heat requirements from season to season. Slightly more sophisticated setups can include the use of thermostats to automatically turn lights off and on and to maintain steady temperatures.

The other lighting consideration is that of bright white light during the daytime for both the psychological well-being of the iguana as well as your own enjoyment in observing the animal in its enclosure. A "wide spectrum" fluorescent bulb is probably the best choice here, but it should be pointed out that there is really no substitute for natural sunlight. One hour of sunlight per day is more beneficial than several hours per day of these so-called wide spectrum lights which in several studies have been shown to provide little or none of the beneficial UVB rays needed for the synthesis of vitamin D<sub>3</sub> and the utilization of calcium in the animal's system. For animals that cannot have access to natural sunlight, the addition of a black light bulb that provides UV light in the 290-320 nanometer wave lengths may be helpful.

#### **LIGHT BULB ALERT**

**R**ecently, Energy Savers Unlimited, Inc., has introduced an incandescent (non-fluorescent) light bulb that is marketed as a "full spectrum daylight heat lamp." Consumers may conclude that "full spectrum" implies that the bulb supplies sufficient UV light to maintain iguanas in good health. However, IIS has learned from several sources that the bulbs provide such small quantities of UV light that, when used as the only UV light source, iguanas may succumb to metabolic bone disease (MBD). For example, when the bulbs were used as the only light source for 10 juvenile green iguanas at Southern College, all animals began to show symptoms of MBD—some severe—within 3-4 months. By replacing the lights with much more effective full-spectrum fluorescent bulbs, the symptoms completely reversed during the next 6-8 weeks (except for one lizard that died and two others that still exhibit very minor jaw disfigurement). Although the bulb works fine as a heat lamp, IIS urges iguana enthusiasts to rely only on full-spectrum fluorescent bulbs as a UV source when natural sunlight cannot be supplied.

Never place a glass terrarium in direct sun to obtain natural sunlight for your iguana: the glass filters out the beneficial UV rays and the temperature within such an enclosure can quickly reach lethal levels. Instead, construct a wire mesh cage half covered by a tarp, plywood sheeting, or other material to provide a shady place for the iguana to move into if it becomes too warm. Another method is to provide an indoor platform in front of an open window with its screen securely in place. Again, allow an area on the platform where the iguana can move out of the sunlight.

#### **Select a Healthy Pet**

Once you are sure you have your cage properly set up, you want to choose an iguana that appears to be in excellent health. Look for an animal that seems alert, has good weight, and is relatively calm. Avoid individuals that are thin, have signs of external parasites or have loose runny stools. Many pet stores now offer free veterinarian checkups for new iguana owners and it is a good idea to take advantage of these as an experienced reptile veterinarian can be an excellent source of medical and husbandry information. You may want to take a stool sample to the exam and, for a small charge, a fecal analysis can be done to check for endoparasites.

#### **Diet and Nutrition**

After placing the iguana into its new home, allow several weeks for it to acclimate completely and begin feeding normally before attempting to handle and tame the animal. Newly acquired iguanas may initially be reluctant to feed and can sometimes be enticed with brightly colored fruits, edible flowers, and small amounts of monkey chow or dry low fat premium dog food soaked in water first to soften. Iguanas that are not feeding normally may become dehydrated, for they obtain most of the water they need from their food. To hydrate animals soak them for about 15-20 minutes every other day in one or two inches of warm water in a tall container such as a five-gallon bucket. It is also advisable to keep weekly (or more often) weight records to determine if the iguana is gaining or at least maintaining its weight. An animal that continues to lose weight



Adult male green iguana, *Iguana iguana*, from Costa Rica, Central America. Photograph: R. Wayne Van Devender

may need to be force fed and checked for parasites. Consult a veterinarian for help in these procedures.

Once your iguana has begun to feed normally, it is important to wean it onto a balanced healthy diet. Probably no aspect of iguana care has changed as much in the last few years as diet. Original information on diet was primarily provided by iguana ranchers whose main objective, it must be remembered, was to raise iguanas as quickly and economically as possible to a size suitable for human consumption! Some of the diets recommended as much as 50 percent supplemental animal protein in the form of dog food or monkey or primate chow biscuits. We now know that these high animal protein diets provided an accelerated growth rate, but also caused many health problems: visceral gout, cystic calculi, renal failure, and infertility.

The bulk of any good iguana diet should be green leafy vegetables with a positive calcium-to-phosphorus ratio. These include collard greens, chard, beet greens, parsley, mustard greens, kale, turnip greens, dandelion greens, alfalfa, bok choy, and so forth. Members of the cabbage family (cabbage, kale, brussel sprouts, bok choy, broccoli,

and cauliflower) are fine in small amounts, but in large quantities can cause thyroid problems and goiters in reptiles. Spinach and beets contain oxalates which act as calcium binders and should be fed only sparingly. Other vegetables which can be chopped or grated and added to the basic mix of at least three of the above greens are squash, carrots, string beans, peas, corn, sweet potatoes, and sprouts; fresh, frozen or canned (not dried) beans (garbanzo, soy, limas, kidneys, etc.); and prickly pear cactus pads. These vegetables should constitute about 80 percent of the diet.

Fruits and flowers can make up another 15 percent of the diet. Good choices are figs, melons, grapes, cactus apples, pears, tomatoes, apples, peaches, plums, guavas, papayas, mangos, and most berries. Bananas have a very low calcium-to-phosphorus ratio and should be fed in only small quantities. Edible flowers are relished by iguanas and can include hibiscus, dandelions, geraniums, nasturtiums, carnations, roses and squash blossoms.

The remaining one to five percent of the diet can be sources of supplemental protein—commercial foods such as dry low-fat premium dog foods (Science Diet Canine Maintenance Light,

Iams Less Active, Pro Plan Dog Lite, etc.), fortified crickets and meal worms. This figure is for juvenile, gravid or post-gravid iguanas and the percentage of protein can be dropped to as low as one percent for most adult iguanas. Although many experts feel an iguana needs 20 percent protein in its diet, many of the vegetables offered contain plant protein and it is questionable whether iguanas actually need any animal protein to do well. Make sure all food is chopped to appropriate bite size for each iguana. A food processor works well in preparing a fine mix for small iguanas.



Adult male green iguana, *Iguana iguana*, from Columbia, South America.  
Photograph: Ken Glander

Several new commercial iguana foods which claim to be nutritionally complete have appeared in the last few years and may be a convenient way to feed iguanas, if the manufacturers' claims can be substantiated. Hatchling to one-year-old green iguanas should probably be fed on a daily basis, while older animals may be offered food about three times per week.

A controversial issue in iguana diets is the use of vitamin and mineral supplements. While over-supplementation has sometimes been shown to cause problems in adult iguanas, most researchers feel that it is a useful and necessary part of an appropriate diet for juveniles and ovulating females. A mix of one part powdered bird or reptile vitamins to one part calcium supplement may

be dusted lightly over food two or three times per week for iguanas in the high-need group and once a week or less for other adults. It should be pointed out, however, that some of the top breeders of common and rare iguanas in the U.S. use no supplementation whatsoever, relying solely on a very diverse, well-balanced herbivorous diet.

### Determining Sex

Iguanas, especially immature individuals, are somewhat difficult to sex externally. Adult males in general are larger, have bigger heads and jowls, taller dorsal crest scales, larger femoral pores, and

develop enlargements on the ventral base of the tail which indicates the presence of hemipenes, their reproductive organs. Before the onset of these secondary sexual characteristics, other methods may be used to sex iguanas: manually everting the hemipenes by exerting pressure on the tail base, and the use of sexing probes; males probe about two to two and one-half times the depth of a similar

sized female. Both of these procedures should only be attempted by persons experienced in their operation. There is even a company in California which sexes birds by the examination of a drop or two of blood and has expressed a willingness to develop a similar technique for iguanas.

### Reproduction

Green iguanas grow rapidly, reaching sexual maturity in their second or third year. The smallest breeding females measured in the wild in Colombia and Nicaragua are about 200-250 mm snout-to-vent length and are believed to be 21 to 33 months old.

As iguanas mature, they become territorial and can be quite aggressive toward one another.

This natural fact is often ignored in captive collections wherein numerous individuals are commonly housed together. Conditions can change rapidly in these "compatible" groups and an iguana may one day be found with severe wounds inflicted by a cage mate, particularly during the breeding season.


Iguanas are, therefore, best housed individually or, if breeding is the ultimate goal, one male to one or two females in a spacious, well-designed enclosure with visual barriers and individual basking sites.

The timing of egg laying varies considerably, apparently depending upon latitude. Oviposition usually takes place in March and April in Belize, in April and May in Florida, and in June and July in southern California. It is believed that successful copulation occurs approximately 40 to 50 days before the eggs are actually laid and males may become very aggressive at this time, both toward other iguanas and their human owners. Several weeks before females lay, they often reduce their food intake. It is important at this time to ensure that they have a proper nest site in which to construct a nest burrow and deposit their eggs, sometimes numbering from 30 to 60 or more in a clutch. Outdoors, a pit or open box filled with moist sand or potting soil works well. Indoors, a closed plastic container with a hole cut for entry and filled with a suitable nesting material works equally well.

Once laid, the eggs are best removed and incubated artificially in covered plastic containers half-filled with moistened vermiculite. This incubation medium is formulated by adding one to one and one-half parts distilled or purified water, by weight, to the dry material. Eggs are kept in the same position as they were laid, half buried in the vermiculite, with the other half exposed to the air, and are placed into an incubator set at 86 °F (30 °C). The lid to the container is opened for one minute every three days to allow for some air exchange, and any infertile, molding eggs are removed.

If all goes well, the hatchlings emerge after about 70 to 90 days. As the hatchlings begin to exit the eggs, it is best to replace the lid of the egg container with a vented cover and to leave the

babies in the container for up to three days to allow the "umbilical" scar to heal. Hatchlings begin to feed within about two weeks and are offered a very fine mix of the same diet fed to adults along with a few small insect food items. Some studies indicate that hatchlings may benefit from being fed small quantities of fecal matter from a healthy adult iguana to establish the initial microflora needed for effective hindgut fermentation.

Considering the huge number of green iguanas in captivity, very few have actually bred and successfully produced offspring. As we learn more about the nutritional, physical, and psychological requirements of these fascinating lizards, this aspect of their biology will be something that more and more green iguana enthusiasts will be able to experience and enjoy. 

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