Carolina anole

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The **Carolina anole** (*Anolis carolinensis*) is an arboreal lizard found primarily in the southeastern United States and some Caribbean islands. Other common names include the **green anole**, **American anole** and **red-throated anole**. It is also sometimes referred to as the **American chameleon** due to its ability to change color from several brown hues to bright green (though it is not a chameleon).

Carolina anole

Conservation status

Least Concern (IUCN 3.1)[1]

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Family:	Dactyloidae
Genus:	*Anolis*
Species:	***A. carolinensis***

Binomial name

Anolis carolinensis

Voigt, 1832[2]

Subspecies

A. c. carolinensis
A. c. seminolus

Contents

Description

The Carolina anole is a small to medium sized lizard, with a slender body. The head is long and pointed with ridges between the eyes and nostrils, and smaller ones on the top of the head. The toes have adhesive pads to facilitate climbing. They exhibit sexual dimorphism, the males being fifteen percent larger. The male dewlap (throat fan) is three times the size of the female's and red, whereas that of the female is white.[3]

Adult males are usually 12.5–20.3 cm (4.9–8.0 in) long, with about 60-70% of which is made up of its tail, with a body length up to 7.5 cm (3.0 in) and can weigh from 3–7 g (0.11–0.25 oz).[3][4][5][6]

Coloration and color morphs

Colour varies from brown to green and can be changed like many other kinds of lizards, but anoles are closely related to iguanas[7] and are not true chameleons. Although *A. carolinensis* is sometimes called an 'American chameleon', true chameleons do not occur in the Americas, and *A. carolinensis* is the only lizard in

its area of distribution capable of changing colour. In contrast, many species of true chameleons display a greater range of colour adaptation, though some can hardly change colour at all.[3][8]

The typical coloration for a green anole ranges from the richest and brightest of greens to the darkest of browns, with little variation in between. The color spectrum is a result of three layers of pigment cells or chromatophores: the xanthophores, responsible for the yellow pigmentation; cyanophores, responsible for the blue pigmentation, and melanophores, responsible for the brown and black pigmentation when the background is other than green and the anole changes color to camouflage itself. In bright light, against foliage, it appears emerald in colour, but in shadier, cool or moist conditions grey to olive brown. However the colour change is not simply a matter of matching background, but rather body temperature, stress and activity. Green reflects activity and bright light, whereas brown reflects reduced activity in moist, dark cool conditions.[3][8]

A lack in one of the pigment genes causes color exceptions. These color mutations are also called phases. The rare blue-phased green anole lacks xanthophores, which results in a blue, rather than red, often pastel blue, anole. These specimens have become popular recently in the pet trade market. When the anole is completely lacking xanthophores, it is said to be axanthic and the animal will have a completely pastel- or baby-blue hue. They are extremely rare—usually produced in one of every 20,000 individual anoles in the wild. Another phase is the yellow-phased green anole, which lacks cyanophores. Colonies of these rare color-phased anoles have been reported, but anoles with these color mutations rarely live for long, since the green color provides camouflage for hunting down prey, as well as hiding from predators.

Male anole (Green form)

Detail of head, green

Female anole (Brown form)

Detail of head, brown

Taxonomy

Anolis carolinensis is a species of the large *Anolis* genus of lizards within the Dactyloidae family (anole lizards). Within the genus, thirteen species have been identified as a distinct clade, referred to as the *Anolis carolinensis* series of anoles. This group are mid-sized trunk crown anoles large, conspicuously elongated heads and extreme levels of sexual dimorphism. The species was named by Friedrich Siegmund Voigt (1781 - 1850) in 1832.[2]

Two subspecies are accepted, *Anolis carolinensis carolinensis* and *Anolis carolinensis seminolus*, found in the northern and southern reaches of the species distribution respectively, and hence are also known as the Northern and Southern Green Anoles.

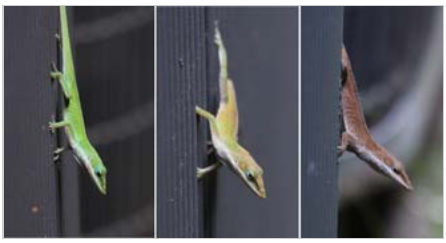
Distribution and habitat

This species is native to North America, where it is found mainly in the southeastern parts of the continent. Anoles are most abundant on the Atlantic Coastal Plains in North Carolina, South Carolina, Georgia

and Florida, and on the Gulf Coast in Alabama, Mississippi, Louisiana, and Texas and have been found as far north as southern Tennessee and southeastern Virginia. In the Carolinas they are found in the coastal plains and southern piedmont of North Carolina, but throughout South Carolina,[8] while in Georgia they are widespread except in the Blue Ridge region.[3]

The species has been introduced into Hawaii and the Ogasawara Islands. In 2012, they were sighted in the San Diego region of southern California.[9]

A. carolinensis is arboreal in nature but may be seen on the ground and frequently seen on shrubs in the low country of the Carolinas, but is also a common sight in urban areas on steps and railings, adjacent to foliage. It is common on roadsides, the edges of forests where there are shrubs and vines, but also building sites having abundant foliage and sunlight. Their preferred habitat is moist forests, and brushy clearings.[3][8]



Color morph from green phase to brown phase

Female anole (brown) displaying dewlap

Conservation

Carolina-anole males that encounter rival males frequently find it is an introduced and invasive brown anole (*Anolis sagrei*). When browns first appeared in the United States in the early 1900s,[10] the Carolinas ceded their ground-level territories and were relegated to a very different ecosystem high in the treetops. On occasion, a more aggressive Carolina anole may be seen closer to the ground and in competition with the brown anoles.

Currently *A. carolinensis* is abundant in its area of distribution, and is able to thrive in disturbed areas, so is not considered threatened, but the brown anole represents a theoretical threat in the future.[3]

Contrasting colours

Behavior

Male anoles are strongly territorial creatures. Some have even been witnessed fighting their own reflections in mirrored glass. The male will fight other males to defend his territory.[11] On sighting another male, the anole will compress his body, extend the dewlap, bob his head and attempt to chase the rival away. If the rival male continues to approach, anoles will fight. Their territory, which is about 1 m^3 (35 cu ft), usually includes two to three females.[3][8]

Anolis carolinensis on Confederate jasmine, South Carolina, demonstrating camouflage

The Carolinian anole is diurnal and active throughout the year, peaking in spring and fall. Winter activity is dependent on sun and temperature.[3]

Diet

The anole's diet consists of small insects such as crickets, grasshoppers, spiders, and other arthropods.[3][8] it also eats grasses.

Many people who keep these lizards as pets feed them mealworms, grubs, and maggots, and small crickets. Mealworms though can be tough on their digestive track due to hard exteriors.

Carolina anoles fighting

Predators

Major predators include the broadhead skink, snakes and birds. Like many lizards, anoles display autotomic tails, which when broken off, continue to move. This hopefully distracts the predator and helps the anole to escape. A new tail then starts to develop[3]

Reproduction

Anole displaying at its reflection

The typical breeding season for green anoles starts as early as April and ends in late September, gonadal activity being largely regulated by photoperiod, enlarging in spring as the weather warms up and days lengthen, and then regressing in late summer.[3][8]

During this time, the males patrol their territory and most brilliant displays of these creatures can be seen, as the males defend their territory and females, while courting the females with their elaborate displays of extending their brightly colored dewlaps while bobbing up and down, almost doing a dance. The dewlap is also used to ward off other males. The male courts and pursues a female until the two successfully mate. Usually, when the female is ready to mate, she may let the male simply "catch" her and he will thus grasp a fold of her skin above her neck area, or she will bow her head before him and simply "let" him take his grasp. At this point, the male will position his tail underneath the female's near her vent and mating will take place.[3]

Carolina anole licking

The female matures one ovarian follicle at a time, the ovaries alternating in production. The sight of a courting male induces ovarian development, sexual receptiveness and then ovulation. About two to four weeks following mating, the female lays her first clutch of eggs, usually one or two in the first clutch. She can produce an egg every two weeks during the breeding season, until about 10 eggs have been produced. However, she can store sperm for up to eight months following mating. She then buries the soft shelled eggs in a shallow depression in soft soil, leaf litter, compost, rotting wood or even a hole in a nearby tree. Eggs average 12.5 mm (0.49 in) by 9.3 mm (0.37 in) in size.[3]

Carolina anole eating a moth

The eggs are left to incubate by the heat of the sun, and if successful, will hatch in about five to seven weeks (30–45 days) from late May to early October. On hatching, the hatchlings are 52–67 mm (2.0–2.6 in) in length.[3][8]

The hatchlings must fend for themselves; anoles are by nature solitary animals since birth, and are not cared for by either parent. The young hatchlings must be wary of other adult anoles in the area, as well as larger reptiles and mammals, which could eat them. Younger anoles differ from adults in having less obvious head ridges, a wider head and shorter tail. They mature in about eight months.[3]

Captivity

Despite being a beginner pet, green anoles may or may not adapt readily to cage life. Care must be used to make them happy to the best of one's ability to compensate and aid them in adapting. Green anoles nervous nature makes it advisable not to attempt to handle them very often. Green anoles live in a terrarium such as a 20-gallon aquarium, or larger, with numerous plants lining the back and sides of the cage. Leave an open area in the front center as a place that feeder insects can be dropped in clear view of hungry green anoles. Green anoles like to leap down on potential prey and engulf it. Provide a heat light over some of the highest plants so green anoles can bask directly below it. Water is best administered with a mist bottle or a water dish. Wet the leaves so the drops of water can be lapped off. A small corner-set water bowl is also good to have present.

Male anole with extended dewlap

Genomics

This species has been chosen as a model reptile for genomics by the National Human Genome Research Institute genome sequencing program.[12] It was selected because of the ease and low cost of laboratory breeding and evolutionary value of the diversity of the genus.[13] In 2011, the complete genome of this lizard was sequenced and published in *Nature*.[14] Before its genome was published, only mammals and three bird species had been sequenced among amniotes.[15] The draft genome sequence is 1.78 Gb (compared with 2.0–3.6 Gb mammalian and 0.9–1.3 Gb avian genome assemblies), of which 27% are mobile elements such as LINEs. A total of 17,472 protein-coding genes and 2,924 RNA genes were predicted from the *A. carolinensis* genome assembly.[16]

Carolina anoles mating

Juvenile male

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External links

- Anole genome sequencing project at NCBI (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=genomeprj&cmd=Retrieve&dopt=Overview&list_uids=18887)
- *Carolina anole* (http://www.eol.org/pages/795869) at the Encyclopedia of Life
- "Breeding green anoles (*Anolis carolinensis*) in captivity" (http://users.volja.net/bamare/)
- Green anole care sheet (http://www.reptileexpert.org/green-anole-care/)
- View the Carolina anole genome (http://www.ensembl.org/Anolis_carolinensis/Info/Index/) in Ensembl.

Categories: IUCN Red List least concern species | Animals described in 1832 | Anoles | Chordates with sequenced genomes | Fauna of the Southeastern United States | Reptiles of the United States | Reptiles of the Caribbean | Reptiles with sequenced genomes

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