GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Anolis carolinensis***

Anolis carolinensis **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia		Polychrotidae

Common name green anole (English), Carolina anole (English), rotkehlanolis (German), anole vert (French), anolis verde (Spanish), northern green anole (English)

Synonym
Anolis carolinensis , (Voigt 1832)
Lacerta principalis , Linnaeus 1758 (fide Dumeril & Bibron 1837: 121)
Anolis bullaris , Daudin 1802: 69 (part.)
Dactyloa (Ctenocercus) carolinensis , Fitzinger 1843: 68
Anolis principalis , Gray 1845: 202
Anolis carolinensis , Dumeril & Bibron 1837: 120
Anolis carolinensis , Boulenger 1885: 43
Anolis principalis , Loennberg 1894
Anolis carolinensis , Liner 1994
Anolis carolinensis , Mckeown 1996
Anolis carolinensis , Nicholson *et al*. 2005
Anolis carolinensis seminolus , Vance 1991
Anolis carolinensis seminolus , Collins & Taggart 2009

Similar species

Summary
The green anole, Anolis carolinensis is a moderate sized arboreal lizard native to the southeastern United States. Most likely spread through unintentional transport, alien populations have managed to establish on numerous islands in the Caribbean Sea and Pacific Ocean, including the Ogasawara Islands, Japan. Here *A. carolinensis* is thought to have played a significant role in the extinctions and population declines of many species of endemic insects through predation. Projects are underway to manage this species through use of adhesive traps and exclusion fencing, with preventing the spread of *A. carolinensis* to uninvaded nearby islands having priority.

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Species Description
Anolis carolinensis is a moderately sized anole with introduced populations on Hawaiian islands ranging from 51 - 76 mm SVL (snout to vent length) (Muensch *et al.*, 2006). On the Ogasawara Islands, males reached a maximum length of 74 mm SVL while females grew up to 60 mm SVL with a tail length about double the individual SVL length (Toda *et al.*, 2010).

Notes
Two subspecies are recognised *Anolis carolinensis carolinensis* (Voigt, 1832) and *Anolis carolinensis seminolus* Vance, 1991 (Reptiles Database 2010).
A. carolinensis is preyed upon by numerous taxa in its home range (Schaefer *et al.*, 2009) including feral pigs (*Sus scrofa*) (Jolley *et al.*, 2010). The invasive brown anole (*Norops sagrei*) also competes with *A. carolinensis*.

Habitat Description
Anolis carolinensis is arboreal and generally uses any type of forested habitat; it can be found in vegetation around urban and suburban areas (Wiles & Guerrero, 1996; Mount, 1975; in Gates & Gates, 2006). It has also been observed using vegetation around water or in wetland situations with Gates & Gates (2006) making an observation of *A. carolinensis* travelling across floating alligator weed, perhaps to feed on invertebrates on the plants or the water surface. A higher shrub density in its native range has been associated with higher *A. carolinensis* abundance (Schaefer *et al.*, 2009).

Reproduction
Ten female *Anolis carolinensis* individuals from Chichijima, in the Ogasawara Islands laid 138 eggs from May to October with the average number of eggs laid per season per female being 13.8 (Noriyuki Komatsu, pers. Comm.; in Toda *et al.*, 2010). Incubation lasts about 40 days (Hasegawa, 2004; in Toda *et al.*, 2010), with the first hatchings strating to appear in June and seen most frequently in September (Toda *et al.*, 2010). The breeding season on the Ogasawaras is thus estimated to extend from April to October, with a maturation period of about 1 year (Toda *et al.*, 2010). The potential longevity of this species is estimated to exceed 7-8 years (Toda *et al.*, 2010).

Nutrition
Anolis carolinensis like other anoles is primarily insectivorous (Muensch *et al.*, 2006). On Chichijima and Hahajima, Ogasawara Islands, a stomach content analysis undertaken by the Japan Forest Technology Association 2005; in Toda *et al.*, 2010) revealed that *A. carolinensis* preyed most frequently on Hemiptera and Coleoptera, as well as Lepidoptera (mainly larvae) and Hymenoptera (mainly ants).

General Impacts
Anolis carolinensis has had the largest impact on the Ogasawara Islands, where increased predation pressure on endemic insect species has played a significant role in the extinctions of species such as the tricolored tiger longhorn (*Xylotrechus takakuwai*), the Ogasawara tumbling flower beetle (*Glipa ogasawarensis*) and the Ogasawara carabid beetle (*Colpodes boninensis*) as well as contributued to the decline of insect pollinators (Abe *et al.*, 2008), endemic odonates (Yoshimure & Okochi, 2005) and diurnal longicorn beetles (Makihara *et al.*, 2004).

Management Info
Please follow this link for a more detailed information on the management of *Anolis carolinensis*. A summary can be found below.
Preventative measures: *A. carolinensis* is likely to be difficult to control in areas where it is widespread and abundant such as the islands of Chichijima and Hahajima in the Ogasawara Islands of Japan (Toda *et al.*, 2010). As such, priority should be given to preventing its spread to nearby islands which still have healthy endemic insect populations (Yoshimura & Okochi, 2005). The chances of *A. carolinensis* finding its way onto ships travelling to these islands has been attempted by intensive trapping at piers and surrounding residential areas (Toda *et al.*, 2010). While a reduction of density was achieved in the area, rapid increases occurred through immigration and highlighted the need for exclusion fencing in key areas (Toda *et al.*, 2010).

Use of Teflon coverings on steel mesh fences have shown to be effective in blocking the movement of *A. carolinensis* in both indoor and field trials, with a number of sites on Hahajima showing positive results from their use (Toda *et al.*, 2010).

Monitoring: The use of 1 x 1m pieces of burlap fabric tied to tree trunks has been shown to be an effective and non-destructive sampling method for *A. carolinensis* and other reptile species in its home range (Horn & Hanula, 2006).

Physical: The primary method used on invaded Ogasawara Islands is the use of adhesive traps placed on tree trunks (Toda *et al.*, 2010). While not as efficient a method such as angling, they are able to provide longer-term continuous pressure on *A. carolinensis* populations; they also do not require the use of food or attractant baits as trunks of trees are frequently used to travel between the tree crown and the ground (Toda *et al.*, 2010).

Chemical: While consumer reptile sprays for use against habu vipers were trialled against *A. carolinensis*, these were not implemented as the risks of negative environmental impacts were too high (Toda *et al.*, 2010).

Integrated management: The exclusion of *A. carolinensis* from specific areas by intensive trapping using Teflon covered fences is necessary to fragment their dispersal range and allow the restoration of endemic species in key locations (Toda *et al.*, 2010).

Principal source:

Compiler: IUCN SSC Invasive Species Specialist Group (ISSG) with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

Review:

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ALIEN RANGE

[1] ANGUILLA
[1] BELIZE
[2] JAPAN
[1] UNITED STATES
[1] BAHAMAS
[2] CAYMAN ISLANDS
[1] NORTHERN MARIANA ISLANDS

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27 references found for **Anolis carolinensis**

Managment information

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IUCN/SSC Invasive Species Specialist Group (ISSG)., 2010. A Compilation of Information Sources for Conservation Managers.
Summary: This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.

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