

## Inleiding

Klas:

bovenbouw  
havo/vwo

Thema:

Onderzoek,  
vaardigheden,  
DNA, ecologie

Trefwoorden:

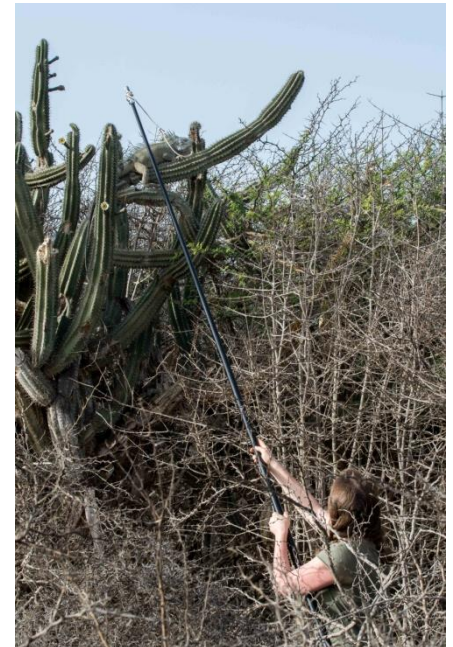
leguanen,  
onderzoek,  
DNA-analyse

In juni 2018 hebben onderzoekers op de ABC-eilanden onderzoek gedaan naar Leguanen. De DNA-analyse moet meer duidelijkheid geven over de verwantschap tussen de populaties. Thijs van den Burg van de Universiteit van Amsterdam vertelt over het hoe en waarom van wetenschappelijk onderzoek.

**Why** are scientists studying the Curacao iguana and **how** are they (in general) going about it.

In the last two decades, many “species” that are distributed across large geographic regions have been shown to actually consist of multiple, nearly identical morphological species (cryptic diversity) when examined using genetic data. This is especially important from a conservation standpoint because it is difficult to protect a species if you don’t know that it exists! Range-wide genetic analyses in the Green Iguana (*Iguana iguana*) showed that it has four genetic groups, of which one, Curacao is very different. In fact, the difference between Curacao and the other groups is larger than between some other iguanid species. It is possible that iguana populations on the ABC islands and also Venezuela, within the Maracaibo Delta, belong to this distinct genetic group. One of the objectives of our project is to collect samples from these areas in order to investigate this question.

In addition to being genetically distinct, the iguana population on Curacao has other attributes that distinguish it from most other green iguana populations. It evolved in the extremely dry environment on Curacao and has a different growth pattern, shorter maximum body length, a lack of size difference between sexes (sexual dimorphism), and a smaller average clutch size with larger eggs and larger hatchlings compared to other *I. iguana* populations that have evolved in tropical wet environments. Even though the Curacao iguana population has these uniquely adapted life history and genetic features, to-date the attention of





conservation and research has mostly been focused on the Caribbean *I. iguana* populations with striking color patterns (e.g. Saba, Montserrat, and St. Lucia). Today no research or conservation effort is yet focused on Curacao iguanas. Additionally, lack of morphological data from the Curacao population and lack of both genetic and morphological data from nearby mainland populations (Colombia and Venezuela), prohibits us from assessing the taxonomic status of this population. In addition to investigating the level of genetic difference of the Curacao population in comparison to these regional

populations, these same data will allow us to also increase our understanding of these understudied populations and to support management of those *I. iguana* populations in Venezuela and Colombia.

Alarmingly, there have been reports of mainland iguanas being transported to Curacao and subsequently released, establishing at least one satellite population on the island. If true, cross breeding (hybridization) with these continental lineages and non-adapted mainland iguanas threatens the survival of the Curacao population. If true, it is only a matter of time before cross breeding would occur on Curacao and the integrity of this uniquely adapted population will be compromised. Whether or not green iguanas from outside of Curacao have established themselves on the island can be determined through genetic sampling across the island.



The Curacao iguanas should be recognized for their connection to other species and ecosystem processes on the island. Keystone species play an important role in ecosystem and many other species rely on it for e.g. consumption. Especially in small island ecosystems these species play a vital role. On the ABC islands the iguana is such a species, and a healthy iguana population makes up a large percent of biomass and effects ecosystem

in many different ways. Firstly, iguanas are the primary natural herbivores on the island. Their most critical role is to make the energy and nutrition in plants available to the rest of the species that cannot eat plants, and convert it to more iguanas by growing and reproducing or defecating the free energy from the sun that powers photosynthesis. Secondly, iguanas are food for lots of other animals, especially when they are young and small. They are eaten by many birds (e.g. falcons, herons, Warawara, and raptors), crabs, and snakes. Adult iguanas are only naturally eaten by larger predators like the white hawk. When iguanas hatch they leave behind eggshells and membranes that provides nutrition for soil microbes and also many insects and scavengers. Also, when female iguanas are creating their nests they excavate deep into the soil and build long tunnels. This churns the dirt and redistributes nutrients to all of the surrounding plants, microbes, and detritivores, while also aerating the soil and letting in oxygen. Lastly, iguanas are herbivores and eat fruit, flowers, and leaves. The seeds of the fruits get deposited around the forest with their feces. Passing through the gut of the iguana stimulates the seeds to germinate much better than seeds that have not gone through this important passage. As an added bonus, the lucky seeds are also deposited within a nutritious packet to get their lives off to a good start.



As locals know, iguanas on this island are heavily hunted to serve as a food source and, with more people immigrating to Curacao; we suspect local consumption rates could increase and we worry about the potential arrival of continental iguanas. While *I. iguana* is assessed as “Least Concerned” under the International Union for Conservation of Nature guidelines, local populations of this species can be highly threatened and even disappear from large areas. This happens when hunting pressure is too great and habitat for breeding, eating, social interactions, and/or protection from predators is not available for them. Aforementioned threats and our poor knowledge regarding the health and status of this unique population highlight the need for immediate research and conservation efforts.