

## Estimation of the invasive potential of reptile species in the Caribbean region

# endemic species # exotic invasive species



*Anolis richardii* © Charles J. Sharp

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COUNTRY  
Guadeloupe

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### Context

The insular Caribbean is one of the world's most important biodiversity hotspots. It is particularly rich in reptiles. However, there are several threats to the biodiversity of the Caribbean islands. The first is the destruction of natural habitats. The second is the impact of invasive alien species. This threat impacts native species through various mechanisms, such as competition and predation. Invasive alien species not only have a strong ecological impact, but also an economic one, including the cost of managing them, as well as the damage they cause to ecosystem services, human infrastructure and agriculture. In the insular Caribbean, these include a large number of reptile species, including lizards (e.g. the common Iguana, *Iguana iguana*), snakes (e.g. the corn Snake, *Pantherophis guttatus*) and turtles (e.g. the pond slider, *Trachemys scripta*) from other Caribbean islands or continents.

### Objectives

The study consisted in compiling a database listing all reptile species found in the insular Caribbean, including native, introduced and invasive species. This database was used to estimate the invasive potential of the reptile species listed, that is the probability of a species becoming invasive in the insular Caribbean. In addition, the study highlighted the important ecological and life-history traits that determine the invasiveness of exotic invasive reptile species in the insular Caribbean.

### Methods

#### *Creation of a database*

A census of reptile species (lizards, turtles and snakes) present in the Caribbean was carried out. Their life-history traits and ecological characteristics were also recorded to create a database. To this end, several bibliographical references, including books and scientific articles, were consulted, as well as databases available on the Internet.

### Modeling

Statistical modelling was used to highlight the key variables determining the invasiveness of invasive alien species, and to estimate the invasive potential of the species assessed. The chosen model is the random forest model, which enables us to analyze large databases without taking into account the collinearity of variables and phylogenetic links. With this tool, we were able to estimate the invasive potential of reptile species native to the Caribbean region and of species considered as exotic pets.

## Results

The analyses highlighted several species with a high invasive potential among species native to the Caribbean and exotic pets. Four variables appeared to be of importance in determining the invasiveness of exotic invasive reptile species in the region: animal size, clutch size, altitudinal distribution of the species and number of natural habitats used. These variables are important for a species to establish itself in a new environment, as they are correlated, among other things, with the species' ecological plasticity. The creation of the database has also revealed an increase in the number of invasive reptiles in the insular Caribbean. Indeed, a 2003 study counted 15, while 27 have been identified today.



## About the research team

Yuna Mélane began her Master's degree in September 2021, at the Université des Antilles in Guadeloupe. Her second-year internship began in January 2023 with the NGO Caribaea Initiative within their MERCI project, a project studying invasive alien reptile species in the Insular Caribbean. She was supervised by Dr. Christopher Cambrone (Scientific Coordinator at Caribaea Initiative) and Dr. Etienne Bezault (Senior Lecturer at the Université des Antilles) and funded by Caribaea Initiative.