

GENETIC STUDIES OF THE JAMAICAN IGUANA

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Most captive breeding programs for critically endangered animals are initiated with whatever individuals are available, which often are very few in number. These founders may not be representative of the species as a whole, thus limiting the genetic base of the captive population and jeopardizing its long term viability. Even worse, many founder groups are related, perhaps consisting of a single family, which not only limits their genetic variability but also leads to serious problems with inbreeding depression.

The Jamaican Iguana program presented us with the opportunity to begin in the right way by choosing founders to maximize genetic diversity and minimize relatedness. Shortly after rediscovery of the species, eggs deposited by wild females in the Hellshire Hills were collected to establish the captive breeding program. Only three clutches of iguana eggs were collected in 1991 and three more in 1992. At the worst, these six clutches might have represented the offspring of three females mated to a single male, while at best they represented the offspring of six different females mated to six different males.

To distinguish between the various possibilities, Edward Louis and Tana Wheeler worked in my laboratory to develop DNA markers for *Cyclura*. These markers, known as microsatellites, provide powerful tools for distinguishing individuals and determining parentage. They are

the same type of markers used to produce "DNA fingerprints" of humans for criminal cases.

Using these microsatellite markers, we were able to show that the three clutches in 1991 and 1992 were laid by the same three females, but that those females had mated with two different males. This allowed the captive breeding programs in the Hope Zoo and in U.S. zoos to begin with hatchlings from a balanced representation of all five founders.

Subsequent analyses of 1993 and 1994 hatchlings revealed two additional wild founders nesting in the Hellshire Hills. Therefore, offspring



Rick Hudson collecting blood from a Jamaican iguana at the Hope Zoo.
Photograph: Jeff Lemm

from their clutches were later incorporated into the captive breeding program to further increase genetic diversity.

These genetic markers are also being used in the captive breeding program for the Blue Iguana, *Cyclura nubiola lewisi*, and are providing new insights into the structure of wild *Cyclura* populations throughout the Caribbean. 