

No Males Needed By Marissa Zamora

In the animal kingdom, there are many species who opt for single parenthood. Male Ruby-throated Hummingbirds, for example, rarely have anything to do with building the nest, incubating the eggs, or raising the young. But there are some species who take it a step further, eliminating one parent from the reproduction process entirely. For the New Mexico Whiptail, a lizard native to the desert southwest and northern Mexico, males are a thing of the past. These lizards reproduce asexually via parthenogenesis, a process that allows egg development without fertilization by males. Therefore, all of the individuals of this species are female!

The biology of parthenogenesis can get pretty complicated so here is a shortened version of how it works. In most animals, each male and female parent contributes one set of chromosomes to their offspring. But with parthenogenesis, females gain twice the number of chromosomes they normally have and pass on the equivalent of two sets of chromosomes to their offspring. To make things more complicated, there are two forms of parthenogenesis: obligate and facultative. Obligate parthenogenesis refers to females that only reproduce asexually. Facultative parthenogenesis refers to females that are able to reproduce either asexually or with a male. The New Mexico whiptail engages in the former but there are other fascinating species, like the Komodo Dragon, that engage in facultative parthenogenesis.

Female Komodo Dragons can reproduce asexually if males are not present. This is what happened in the case of Flora, the first known Komodo Dragon to reproduce asexually. Flora lived in London's Chester Zoo where females are kept alone in enclosures, so when she laid fertile eggs, researchers knew that she must have reproduced asexually. When they ran DNA tests just to be sure, their suspicions were correct: Flora was the sole parent!

A very recent and fascinating discovery was made by a team of California Condor researchers. They reported the first two known "virgin births" in this critically endangered species. These two condors were captive-bred and released into the wild. It was only after they died that researchers discovered that they both possessed DNA that matched only their mother. There was no evidence of any male parents' DNA.

In this case, the California Condor provides another example of a species that utilizes facultative parthenogenesis. This is especially significant because just a few decades ago, the California Condor was on the brink of extinction. Luckily, rigorous conservation efforts and breeding programs have helped them bounce back, but they are still considered critically endangered.

There is one caveat of the Komodo Dragon and California Condor's method of parthenogenesis. All offspring made from their asexual reproduction are males, which could lead to decreased genetic diversity. This is one reason that reproduction with two parents results in greater genetic diversity than parthenogenesis. On the other hand, parthenogenesis is beneficial because it allows populations to grow faster and removes the need for females to search for mates. Researchers still have so many questions about this unique form of reproduction, so be on the lookout for any new discoveries!