New species of lizard created in lab that reproduces by cloning itself

May 6 2011, by Bob Yirka

Image credit: PNAS, doi: 10.1073/pnas.1102811108

(PhysOrg.com) -- A genetics research group working in a lab in Kansas, has succeeded in creating a new species of lizard by mating two distinct species of North American Whiptails, both native to New Mexico. The offspring, all females are not only fertile, but can reproduce by laying eggs that don't need to be fertilized, which means, they actually clone themselves.

Scientists have known for years that some species exist due to interspecies mating, the whiptail lizards have provided proof of that; they've been creating new species themselves for at least several hundred thousand years. What's new is the process being manipulated by another species, us, *Homo sapiens*. Geneticists have been trying for years to create a new breed of pretty much anything by urging lab "volunteers" of differing species to mate with one another, not exactly earth shaking science when you consider a dog that tries to mate with a human leg. Efforts such as these are, not surprisingly, more often successful than not; the problem is, the offspring are usually infertile, such as mules, or too weak to survive. The trick has been to create a new species that is able to both survive and reproduce, because otherwise, it can't really be called a new species if it only exists for the duration of one generation.

In a paper published in *PNAS*, lead researcher Peter Baumann of the Stowers Institute for Medical Research, describes how he and his team paired an *A.inornata* male with an *A.exsanguis* female resulting in six eggs; all of which hatched, resulting in young lizards that were more similar to the female than the male, save a bit of blue tint on the tails. Each also had four copies of their parental genes (normally there's just two), three from their mother, the other from their father. They were also all female and all able to reproduce by cloning themselves.

Not only have the initial lizards survived and reproduced, so too have their offspring; the lizards are currently in their fourth generation, leading to the inevitable question of whether they should be given a name. Baumann is hesitant to do so as it's likely to court controversy from the biology/genetics community as the new species hasn't yet been given the opportunity to show that it can exist outside of a lab, though the team members certainly believe it's capable of doing so.

More information: Laboratory synthesis of an independently reproducing vertebrate species, PNAS, Published online before print May 4, 2011, doi: 10.1073/pnas.1102811108

Abstract
Speciation in animals commonly involves an extrinsic barrier to genetic exchange followed by the accumulation of sufficient genetic variation to impede subsequent productive interbreeding. All-female species of

whiptail lizards, which originated by interspecific hybridization between sexual progenitors, are an exception to this rule. Here, the arising species instantaneously acquires a novel genotype combining distinctive alleles from two different species, and reproduction by parthenogenesis constitutes an effective intrinsic barrier to genetic exchange. Fertilization of diploid parthenogenetic females by males of sexual species has produced several triploid species, but these instantaneous speciation events have neither been observed in nature nor have they been reconstituted in the laboratory. Here we report the generation of four self-sustaining clonal lineages of a tetraploid species resulting from fertilization of triploid oocytes from a parthenogenetic Aspidoscelis exsanguis with haploid sperm from Aspidoscelis inornata. Molecular and cytological analysis confirmed the genetic identity of the hybrids and revealed that the females retain the capability of parthenogenetic reproduction characteristic of their triploid mothers. The tetraploid females have established self-perpetuating clonal lineages which are now in the third generation. Our results confirm the hypothesis that secondary hybridization events can lead to asexual lineages of increased ploidy when favorable combinations of parental genomes are assembled. We anticipate that these animals will be a critical tool in understanding the mechanisms underlying the origin and subsequent evolution of asexual amniotes.

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