

## **Last Solution Genetics (?) – Is the Brandenburgian green lizard (*Lacerta viridis*) threatened with extinction by inbreeding depression?**

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The green lizard (*Lacerta viridis*) is a protected and endangered species in Germany occurring only in the states of Brandenburg and Bavaria. The small German relic populations are the result of a range expansion from southern Europe during the postglacial thermal optimum. During the past 50 years, populations declined dramatically in Brandenburg, although the contrary would be expected due to an increasing duration of sunshine in the wake of global warming. In spite of massive habitat improvements of the last 20 years, the number of lizards continues to decrease substantially. Because of that, the suspicion arose that inbreeding depression could play a role. Today, there are only three remaining native populations in Brandenburg (two of them with maximally 40 individuals and the third with approximately 100 individuals). Until now, each of these populations was managed as a distinct entity. The exchange of lizards was strictly avoided in order not to jeopardize possible local adaptations through outbreeding depression. The National Environmental Agency of Brandenburg keeps for many years three exactly documented captive breeding lines (native Brandenburg lizards) with exact pedigree and varying degree of inbreeding. Another breeding line, used as control, originates from the species' core distribution range in the Balkans (Serbia). These breeding lines offer the opportunity to calibrate a molecular marker system for determining the inbreeding degree of wild lizards. In the course of the present study, sampling of captive and wild lizards is done using minimally invasive buccal swaps. When it should turn out that the remaining wild populations of Brandenburg suffer from inbreeding depression indeed, this would have far-reaching consequences for the actual conservation strategy. Then, in contrast to previous conservation measures, genetic exchange between local populations needs to be established. This method can be used also for monitoring two recently reintroduced groups of captive bred green lizards from the native Brandenburg lines and should also be transferable to other species in which, similar to the green lizard, the direct determination of kinship and inbreeding in wild populations is not possible.